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Using the Passport 8672ATME Module

NORTEL NETWORKS™

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Contents

Preface 19

Before you begin 19
Text conventions 20
Related publications 21
How to get help 24

Chapter 1
About the Passport 8672ATME Module 25

Features 26
ATM ELANs, and Ethernet VLANs 27
Virtual network router 27
Traffic shaping 27
RFC 1483 Support 28
Physical description 28
Media dependent adapters 29
Online LED 30
MDA LEDs 31
Console and Diag ports 32

Chapter 2
Passport 8672ATME Module terminology 33

ATM terms and acronyms 33
SONET terms and acronyms 35
SONET transmission rates 36

Chapter 3
Installing the Passport 8672ATME Module 37

Safety and environmental precautions 37
Installing the Passport 8672ATME Module 39
Verifying installation 41
Initialization 42
MDA insertion and configuration 44
Replacing a module 45
Starting the system after a module replacement 46
Starting the system with an empty slot 46

Chapter 4
Managing the Passport 8672ATME Module with Device Manager 47

Port numbering 47
Device Manager 48
Device Manager access and passwords 49
Installing Device Manager 49
Configuring and managing ATM 51
Changing default settings 52
Resetting the module 54
Viewing MDA information 56
Enabling or disabling a port 57
Editing port parameters 58
Editing ATM and framing parameters 58
Editing circuit parameters 60
Deleting a PVC 63
Configuring ATM 1483 ELAN parameters 64
Deleting an ATM 1483 ELAN 69
Configuring ATM F5-OAM End-to-End Loopback 70
Enabling and defining ATM F5-OAM parameters 70
Displaying F5 Loopback statistics 72
Displaying statistics using Device Manager 73
Testing using Device Manager 73

Chapter 5
Managing the Passport 8672ATME Module with the CLI. 75

Configuration commands 76
Module commands 76
1483 ELAN statistics 77
config atmcard elan-stats 77
clear atm elan-stats <vlan id> 77
show atm elan-stats <vlan id> 78
clear atm elan-stats 79
Port commands 79
config atm command 80
config atm pvc command 81
config atm pvc 1483 command 82
config atm info command 84
Show commands 85
show ports info atm all command 85
show ports info atm fdb command 88
show ports info atm ports command 89
show ports info atm pvc command 91
show ports info atm 1483 command 93
show ports stats atmport command 94
show ports stats atm felinecurrent 96
show ports stats atm felineinterval 98
show ports stats atm fepathcurrent 99
show ports stats atm fepathinterval 100
show ports stats atm linecurrent 102
show ports stats atm lineinterval 103
show ports stats atm pathcurrent 104
show ports stats atm pathinterval 106
show ports stats atm sectioncurrent 107
show ports stats atm sectioninterval 108
show ports stats atm sonetmediumtbl 110

Configuring ATM F5-OAM End-to-End Loopback 111
`config atm pvc f5-oam command` 112
show ports info atm pvc [slot/port] 113
show ports info atm f5-oam [slot/port] 114
clear atm f5-oam [slot/port] 115
Displaying packet loss counters 116

Chapter 6
Configuring the Passport 8672ATME Module 117

Initial configuration 117
Changing the clock setting using Device Manager 118
Changing the clock setting using the CLI 119
Basic configuration procedures 120
Bridging point-to-point traffic using an ATM 1483 PVC using Device Manager . . 120
Creating a VLAN “byPort” and adding ports 121
Configuring an ATM 1483 PVC 125
Associating the PVC with the VLAN 126
Bridging point-to-point traffic using an ATM 1483 PVC using the CLI 127
Bridging point-to-multipoint traffic using an ATM 1483 PVC using Device Manager . 127
Configuring two ATM 1483 PVCs on the same ATM port 128
Associating the PVCs with the same VLAN 128
Bridging point-to-multipoint traffic using an ATM 1483 PVC using the CLI 129
Configuring an IP routing 1483 PVC using Device Manager 129
Creating two VLANs “byPort” 130
Assigning IP addresses 130
Enabling RIP routing 132
Enabling OSPF routing 134
Configuring a null-encapsulation PVC 136
Associating the PVC with the VLAN 136
Configuring an IP routing 1483 PVC using the CLI 136

Configuring an IPX routing 1483 PVC using Device Manager 137
Creating two VLANs “byPort” 138
Configuring IPX network numbers 139
Enabling IPX forwarding 140
Enabling IPX network number forwarding 141
Configuring a null-encapsulation PVC 142
Associating the PVC with the VLAN 142
Configuring an IPX routing 1483 PVC using the CLI 143

Chapter 7
Web Management. 145

Appendix A
Technical Specifications 153

Appendix B
Factory defaults 155

Index 157

Figures

Figure 1 Passport 8672ATM module 29
Figure 2 1-port OC-12c/STM-4 MDA 29
Figure 3 4-port OC-3c/STM-1 MDA 30
Figure 4 Passport 8672 ATM module with OC-12c/STM-4 MDA 30
Figure 5 Removing the filler panel 39
Figure 6 Extending the inserter/extractor levers 39
Figure 7 Inserting the Passport 8672ATME Module 40
Figure 8 Closing the inserter/extractor levers 40
Figure 9 Tightening the retainer screws 41
Figure 10 Unsuccessful download screen output 43
Figure 11 Passport 8000 series chassis with Passport 8672ATME Module 50
Figure 12 Interface tab—ATM 52
Figure 13 Card tab 55
Figure 14 ATM tab 56
Figure 15 MDA dialog box 57
Figure 16 ATM tab 59
Figure 17 ATM PVC tab 61
Figure 18 Insert ATM PVC dialog box 62
Figure 19 ATM PVC tab with a PVC selected 64
Figure 20 ATM 1483 ELAN tab 64
Figure 21 Port, Insert ATM 1483 ELAN dialog box 66
Figure 22 Insert ATM 1483 ELAN dialog box for IP routing 68
Figure 23 Insert ATM 1483 ELAN dialog box for IPX routing 69
Figure 24 ATM 1483 ELAN tab with ElanId selected 69
Figure 25 ATM PVC dialog box—ATM PVC tab 71
Figure 26 F5 Loopback dialog box 71
Figure 27 F5 Loopback Stats tab 72
Figure 28 show atm elan-stats command output 78
Figure 29 Sample output for the config atm info command 84

Figure 30 show ports info atm all command output 86
Figure 31 show ports info atm fdb command output 89
Figure 32 show ports info atm ports command output 90
Figure 33 show ports info atm pvc command output 92
Figure 34 show ports info atm 1483 command output 93
Figure 35 show ports stats atmport [<port num>] command output 95
Figure 36 show ports stats atm felinecurrent command output 97
Figure 37 show ports stats atm felineinterval command output 98
Figure 38 show ports stats atm fepathcurrent command output 99
Figure 39 show ports stats atm fepathinterval command output 101
Figure 40 show ports stats atm linecurrent command output 102
Figure 41 show ports stats atm lineinterval command output 103
Figure 42 show ports stats atm pathcurrent command output 105
Figure 43 show ports stats atm pathinterval command output 106
Figure 44 show ports stats atm sectioncurrent command output 107
Figure 45 show ports stats atm sectioninterval command output 109
Figure 46 show ports stats atm sonetmediumtbl command output 110
Figure 47 Sample output for the `show ports info atm pvc [slot/port]` command 114
Figure 48 Sample output of the `show ports info atm f5-oam [slot/port]` command 114
Figure 49 ATM tab 119
Figure 50 Point-to-point bridging using 1483 PVCs 121
Figure 51 Basic tab 121
Figure 52 VLAN, Insert Basic dialog box 123
Figure 53 VlanPortMembers dialog box 124
Figure 54 Point-to-multipoint bridging using ATM 1483 PVCs 128
Figure 55 IP routing with ATM 1483 PVCs 130
Figure 56 IP Address tab 131
Figure 57 IP, VLAN, Insert IP Address dialog box 131
Figure 58 RIP tab 133
Figure 59 OSPF tab 135
Figure 60 IPX routing with ATM 1483 PVCs 138
Figure 61 IPX VLAN dialog box 139
Figure 62 IPX VLAN, Insert dialog box 140
Figure 63 Globals tab 140

Figure 64 Circuits tab 141
Figure 65 System page 146
Figure 66 ATM menu 147
Figure 67 PVC page 148
Figure 68 1483 ELAN page, (left section) 149
Figure 69 1483 ELAN page, (right section) 149
Figure 70 Port page 151

Tables

Table 1 Passport 8672ATME Module online LED indications 31
Table 2 MDA LED indications 31
Table 3 Device Manager port color codes 50
Table 4 Device Manager buttons 51
Table 5 ATM Interface tab fields 53
Table 6 Card tab fields 55
Table 7 MDA dialog box fields 57
Table 8 ATM tab fields 59
Table 9 ATM PVC tab fields 61
Table 10 Insert ATM PVC dialog box fields 62
Table 11 ATM 1483 ELAN tab fields 65
Table 12 Port, Insert ATM 1483 ELAN dialog box fields 66
Table 13 F5 Loopback tab field descriptions 71
Table 14 F5 Loopback Stats tab fields 73
Table 15 config atmcard command parameters and variables 77
Table 16 Information fields for the show atm elan-stats command 78
Table 17 config atm command parameters and variables 80
Table 18 config atm pvc command parameters and variables 81
Table 19 config atm pvc 1483 bridged command parameters and variables 82
Table 20 config atm pvc 1483 ip command parameters and variables 83
Table 21 config atm pvc 1483 ipx command parameters and variables 84
Table 22 Information fields for the show ports info atm all command 87
Table 23 Information fields for the show ports info atm fdb command 89
Table 24 Information fields for the show ports info atm ports command 90
Table 25 Information fields for the show ports info atm pvc command 92
Table 26 Information fields for the show ports info atm 1483 command 93
Table 27 Information fields for the show ports stats atmport command 95

Table 28 Information fields for the show ports stats atm felinecurrent command . . 97
Table 29 Information fields for the show ports stats atm felineinterval command 98
Table 30 Information fields for the show ports stats atm fepathcurrent command 100
Table 31 Information fields for the show ports stats atm fepathinterval command 101
Table 32 Information fields for the show ports stats atm linecurrent command 102
Table 33 Information fields for The show ports stats atm lineinterval command . 104
Table 34 Information fields for the show ports stats atm pathcurrent command . 105
Table 35 Information fields for the show ports stats atm pathinterval command 106
Table 36 Information fields for the show ports stats atm sectioncurrent command 108
Table 37 Information fields for the show ports stats atm sectioninterval command 109
Table 38 Information fields for output of the show ports stats atm sonetmediumtbl command 110
Table 39 F5-OAM Loopback parameters 112
Table 40 Status and statistic definition 115
Table 41 Sample output for the `sh ports stats interface main` command 116
Table 42 Basic tab fields 122
Table 43 VLAN, Insert Basic dialog box fields 123
Table 44 VlanPortMembers dialog box fields 124
Table 45 IP Address tab fields 131
Table 46 IP, VLAN, Insert IP Address dialog box fields 132
Table 47 RIP tab fields 133
Table 48 OSPF tab fields 135
Table 49 IPX VLAN dialog box fields 139
Table 50 IPX VLAN, Insert dialog box fields 140
Table 51 Globals tab item 141
Table 52 Circuits tab fields 142
Table 53 System page fields 146
Table 54 PVC page items 148
Table 55 1483 ELAN page items 150
Table 56 Port page items 151
Table 57 Factory default settings for the Passport 8672ATME Module 155

Preface

The Passport® 8672ATME Module is part of the Nortel Networks Passport line of communications products. This module is the Passport Asynchronous Transfer Mode (ATM) module for the Passport 8600 chassis. This guide describes the features and operations of the module and provides instructions for installing and managing the module.

Before you begin

This guide is intended for network installers and system administrators who are responsible for installing, configuring, or maintaining networks. This guide assumes that you have the following background:

- Understanding of the transmission and management protocols used on your network
- Experience with windowing systems or graphical user interfaces (GUIs)

Text conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is `ping <ip_address>`, you enter `ping 192.32.10.12`
`bold Courier text`	Indicates command names and options and text that you need to enter. Example: Use the **`dinfo`** command. Example: Enter **`show ip`** {**`alerts`**|**`routes`**}.
braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is `show ip {alerts|routes}`, you must enter either `show ip alerts` or `show ip routes`, but not both.
brackets ([ ])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is `show ip interfaces [-alerts]`, you can enter either `show ip interfaces` or `show ip interfaces -alerts`.
ellipsis points (. . .)	Indicate that you repeat the last element of the command as needed. Example: If the command syntax is `ethernet/2/1 [<parameter> <value>]...`, you enter `ethernet/2/1` and as many parameter-value pairs as needed.

italic text	Indicates new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is `show at <valid_route>`, `valid_route` is one variable and you substitute one value for it.
`plain Courier text`	Indicates command syntax and system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is `show ip {alerts|routes}`, you enter either `show ip alerts` or `show ip routes`, but not both.

Related publications

For more information about using a Passport 8000 Series switch, the resident CLI, or Device Manager, refer to the following publications:

- *Release Notes for the Passport 8000 Series Switch Release 3.2* (part number 313198-B Rev 00)

  Provides a list of new features and late-breaking information about the hardware and software that is not included in the Passport 8000 Series switch documentation.

- *Installing and Maintaining the Passport 8003 Chassis and Components* (part number 313074-B Rev 00)

  Provides instructions for installing the Passport 8003 Chassis in an equipment rack and for installing and replacing fan trays, power supplies, modules, gigabit interface converters, and media dependent adapters. This guide describes some of the routine tasks of operating the Passport 8003 Chassis and includes technical specifications for the chassis and the modules.

- *Installing and Maintaining the Passport 8006 Chassis and Components* (part number 312748-B Rev 00)

  Provides instructions for installing the Passport 8006 Chassis in an equipment rack and for installing and replacing fan trays, power supplies, modules, gigabit interface converters, and media dependent adapters. This guide describes some of the routine tasks of operating the Passport 8006 Chassis and includes technical specifications for the chassis and the modules.

- *Installing and Maintaining the Passport 8010 Chassis and Components* (part number 312747-B Rev 00)

  Provides instructions for installing the Passport 8010 Chassis in an equipment rack and for installing and replacing fan trays, power supplies, modules, gigabit interface converters, and media dependent adapters. This guide describes some of the routine tasks of operating the Passport 8010 Chassis and includes technical specifications for the chassis and the modules.

- *Installing and Maintaining the Passport 8010co Chassis and Components* (part number 312746-B Rev 00)

  Provides instructions for installing the Passport 8010co Chassis in an equipment rack and for installing and replacing fan trays, power supplies, modules, gigabit interface converters, and media dependent adapters. This guide describes some of the routine tasks of operating the Passport 8010co Chassis and includes technical specifications for the chassis and the modules.

- *Installing the Breaker Interface Panel for the Passport 8010co Chassis* (part number 312755-B Rev 00)

  Describes how to install the breaker interface panel in an equipment rack, connect cables, and interpret LEDs. It includes technical specifications for the breaker interface panel.

- *Networking Concepts for the Passport 8000 Series Switch* (part number 313196-B Rev 00)

  Provides general information and a description of how a Passport 8000 Series switch handles various networking features, such as VLANs, MultiLink Trunking, OSPF, RIP, and IPX.

- *Network Design Guidelines for the Passport 8000 Series Switch* (part number 313197-B Rev 00)

  Provides guidelines for using the switching and routing features of the Passport 8000 Series hardware and software in your network design. This companion guide to *Networking Concepts for the Passport 8000 Series Switch* incorporates feedback from beta testing of the switch and focuses on optimizing network performance.

- *Getting Started with the Passport 8000 Series Switch Management Software* (part number 313189-B Rev 00)

  Provides instructions for installing the Passport 8000 Series switch management software and describes initial setup procedures.

- *Managing the Passport 8000 Series Switch Using the Command Line Interface Release 3.2* (part number 313194-B Rev 00)

  Describes the command line interface (CLI) structure and the commands used to perform basic switch management operations, such as modifying the switch boot sequence, working with switch files, and setting up security features.

- *Configuring Switching Operations for the Passport 8000 Series Switch Using the Command Line Interface Release 3.1.2* (part number 313191-B Rev 00)

  Describes the CLI commands and parameters for configuring layer 2 (switching) and layer 3 (routing) operations.

- *Managing the Passport 8000 Series Switch Using Device Manager Release 5.x.x* (part number 313195-B Rev 00)

  Describes the structure of Device Manager and how to use it to perform basic switch management operations, such as working with switch files and setting up security features.

- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using Device Manager Release 5.x.x* (part number 313193-B Rev 00)

  Describes how to use Device Manager to configure and manage layer 2 (switching) and layer 3 (routing) functions.

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Chapter 1
About the Passport 8672ATME Module

The Passport 8672ATME Module provides network transmission using ATM technology. The Passport 8672ATME Module enables MAN/WAN/campus connectivity for the Passport 8600 Routing Switch with the capability to interconnect frame-switched networks using a backbone ATM network. The module also provides existing ATM customers with the capability for connectivity to the Passport 8600 Routing Switch. (For more information on ATM, refer to the ATM Forum Web site at the *http://www.atmforum.com* URL.)

The Passport 8672ATME Module occupies a single slot in a Passport 8600 series chassis. The module is a baseboard with room for two of the following optional Media dependent adapters (MDAs):

- 1-port OC-12c/STM-4: single-mode fiber (SMF) or multimode fiber (MMF) using the Synchronous Optical Network (SONET/SDH**)** media
- 4-port OC-3c/STM-1: SMF or MMF using SONET/SDH media

The Passport 8672ATME Module for the Passport 8000 series chassis can be used as an edge device for WAN connectivity in the data center; it is used to connect Passport 8600 to public or private ATM networks. You can also use the Passport 8672ATME Module in the wiring closet in inter-building connection technology in campus networks where each building is supported by frame-switched networks.

Another network application of the Passport 8672ATME Module is a direct connection between one Passport 8600 series switch with a Passport 8672ATME Module in one building to an identical module in another Passport 8600 Series switch at another building. You connect the switches with a dedicated fiber link or with a SONET multiplex network. Each building may be individually supported by either frame-switched or ATM technology.

You can use up to two Passport 8672ATME Modules in one Passport 8600 series chassis.

Refer to *Networking Concepts for the Passport 8000 Series Switch* for a thorough discussion of the complete functionality of the Passport 8000 series product line, including the Passport 8672ATME Module. Note that VRRP, DiffServ, and ATM QoS are not supported on this module.

This chapter provides the following information about the Passport 8672ATME Module:

- "Features" next
- "Physical description" on page 28

Features

The Passport 8672ATME Module has the following features:

- RFC 1483 ATM PVC support
  - Bridged PVC
  - IP routed PVC
  - IPX routed PVC
- Both RFC 1483 LLC/SNAP encapsulation and Null encapsulation
- RFC 1483 point-to-multipoint bridging—up to 64 PVCs per ELAN
- MLT using bridged RFC 1483 PVCs
- VBR traffic shaping per VC channel
- STP support
- F5 OAM end-to-end loopback
- SONET statistics and ELAN/PORT level statistics
- Front-panel Online LED to monitor module operation
- Ability to remove and install a module (hot-swap) without resetting the switch (MDAs are not hot-swappable)
- AAL 5
- Hardware diagnostics

- Proprietary MIB support for configuration of RFC 1483 and ATM port specific setup
- Manageable through the Passport CLI or Device Manager, the SNMP-based graphical interface
- Monitored through a World Wide Web browser from anywhere on the network.

ATM ELANs, and Ethernet VLANs

The Passport 8672ATME Module supports ATM Forum Emulated LANs (ELANs). An ELAN extends an Ethernet VLAN, which is a broadcast domain, over an ATM network.

In general, there is a one-to-one mapping between an ATM ELAN and an Ethernet VLAN. An ATM ELAN never spans more than one ATM port because the software considers each ATM port completely separate.

The Passport 8672ATME Module participates in ELANs as RFC 1483 PVCs. Only Ethernet ELANs are supported on this module**.**

If you delete a VLAN, you delete 1483 ELANs associated with the VLAN.

Virtual network router

Virtual network router (VNR) refers to the routing functions between two ATM virtual/emulated networks. You can use the Passport 8672ATME Module as an IP- and IPX-optimized VNR.

Traffic shaping

The Passport 8672ATME Module provides per channel traffic shaping and supports unspecified bit rate (UBR) and variable bit rate (VBR). Channels with a specified cell rate are called rate-shaped channels.

The VBR service provided by the 8672 module allows a previously idle channel to burst at a relatively high Peak Cell Rate (PCR) for a Maximum Burst Size (MBS) of ATM cells. If the channel exhausts its MBS, the module reduces the channel's rate to a Sustained Cell Rate (SCR). When the channel stops transmitting, it accumulates credit towards another burst at PCR.

The 8672 module also provides a UBR service for Transmitter channels. When a UBR channel is opened, there is no channel rate specified. All active UBR channels are serviced in a round-robin queue. If no rate-shaped channel is scheduled for transmission, a single cell is sent from the channel at the head of the UBR queue.

RFC 1483 Support

The system software on the Passport 8672ATME Module supports the configuration of RFC 1483 LAN clients with multiprotocol encapsulation. RFC 1483 supports standards-based methods of encapsulation that enable connectivity with third-party ATM devices. Multiprotocol encapsulation provides the capability to set up PVCs between Centillion ATM virtual ports (VPorts) and other clients based on LLC encapsulation. The current Centillion platform only supports bridged variations of RFC 1483.

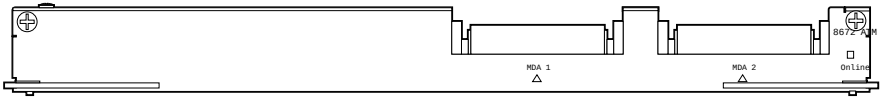
The Passport 8672ATME Module supports the following types of RFC 1483 ELANs:

- RFC 1483 bridged 802.3. The links can be set up within a single device or with another switch. Multiple RFC 1483 links can be set up within one ELAN. Both LLC and NULL encapsulation are supported.
- RFC 1483 routed IP and IPX. An RFC 1483 routed VLAN always contains only one PVC, corresponding to a point-to-point link between routers. The software adds and removes the MAC header, as appropriate. When configuring an IP and IPX routed circuit, the ATM port must be the only port assigned to the VLAN.

Physical description

The Passport 8672ATME Module (Figure 1) is a single-slot module for the Passport 8600 Series chassis. Online LEDs indicate module operation.

Figure 1 Passport 8672ATM module



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To configure and manage the Passport 8672ATME Module, connect to the console port of your switch fabric module (either the Passport 8690SF Module or the Passport 8691SF Module). For information on connecting to the console port, refer to the installation guide that came with your switch.

Media dependent adapters

The Passport 8672ATME Module has space for two media dependent adapters MDAs) that have their own LEDs. You can use up to two of the following MDAs with the Passport 8672ATME Module:

- 1-port OC-12c/STM-4: SMF or MMF
- 4-port OC-3c/STM-1: SMF or MMF

You can mix these MDAs on the Passport 8672ATME Module. Contact your Nortel Networks representative for other MDAs that are available for this product.

Figure 2 shows the OC-12c/STM-4 MDA, and Figure 3 shows the OC-3c/STM-1 MDA.

Figure 2 1-port OC-12c/STM-4 MDA

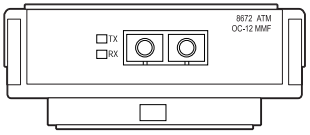

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Figure 3 4-port OC-3c/STM-1 MDA

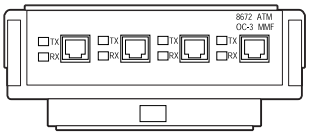

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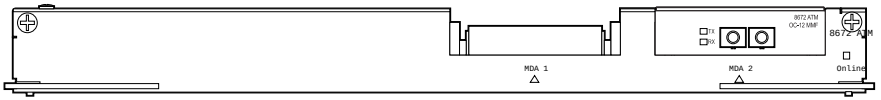
Figure 4 shows the Passport 8672ATME Module with one OC-12c/STM-4 MDA installed. For information on installing the MDAs, refer to *Installing Media Dependent Adapters for the Passport 8672ATME Module*.

Figure 4 Passport 8672 ATM module with OC-12c/STM-4 MDA



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Online LED

The front panel of the Passport 8672ATME Module has an Online LED that indicates whether or not the module has power applied and is initialized correctly.

When the Passport 8672ATME Module is first inserted into the chassis, the Online LED turns amber until the board is recognized by the system and passes a power-on self-test. If the module fails the self-test, the light is off. When the board passes the self-test and goes online, the LED illuminates a solid green.

Note: You cannot configure the Passport 8672ATME Module until the online LED on the module is steadily lit green and you have inserted at least one MDA.

Table 1 lists the Passport 8672ATME Module online LED indications.

Table 1 Passport 8672ATME Module online LED indications

Online LED	State
Off	Card is not receiving power.
Amber	Card is initializing or downloading.
Amber	Card is offline.
Green	Card is online.

MDA LEDs

Table 2 lists the MDA LED indications.

Table 2 MDA LED indications

LED	Color	Port State
Tx	Amber	Alarm (RDI) condition, admin state down
Tx	Green	Transmitting data
Tx	Off	No traffic, no alarm
Rx	Amber	Alarm (OOF/LOF/LOS) condition, admin state down
Rx	Solid green	Admin stateup
Rx	Flashing green	Receiving data
Tx and Rx	Flashing amber	Admin state down, out of order

Note: When there is continuous traffic, the Tx LED is solid green. If traffic is slow, the Tx LED may be flashing green.

Console and Diag ports

Use the Console port on the Passport 8690SF or Passport 8691SF module to access management functions for the Passport 8672ATME Module. For information on connecting to the Console port of either module, refer to *Getting Started with the Passport 8000 Series Switch Management Software*.

The Diag port on the Passport 8672ATME Module is used *only* by Nortel Networks personnel for debugging purposes. You can see diagnostic messages but you cannot input any text.

Chapter 2
Passport 8672ATME Module terminology

This chapter contains the following information:

- "ATM terms and acronyms," next
- "SONET terms and acronyms" on page 35
- "SONET transmission rates" on page 36

ATM terms and acronyms

Asynchronous transfer mode (ATM) is a connection-oriented, cell-based technology that relays traffic across a network. ATM provides a cost-effective way of transmitting voice, video, and data across a network at high speeds. It offers topology-independent, resilient networking technology.

An ATM cell is a fixed-length packet of 53 bytes. It consists of a 5-byte header containing address information and a fixed 48-byte information field. The fixed-length cell size allows you to predict network delays.

The following terms and acronyms are frequently used with ATM information:

- ATM: Asynchronous transfer mode. ATM is a switched, connection-oriented, fixed-length, cell-based transmission method specifically designed to run at high data rates and to carry a complete range of user traffic, including voice, data, and video. ATM uses dedicated media connections running in parallel, allowing simultaneous multiple connections through a single switch device at very high speeds.
- PVC: Permanent virtual circuit. Dedicated connection between devices that is manually set up.

- SVC: Switched virtual circuit. On-demand connection between an ATM or frame relay source and destination that lasts for the duration of the transmission.
- VC: Virtual circuit. This is a network service that provides connection-oriented service regardless of the underlying network structure.
- VP: Virtual path. A virtual path is a set of virtual channels between a common source and destination. The virtual channels in a virtual path are logically associated with a common identifier, the virtual path identifier.
- VPI: Virtual path identifier. Identifier contained in the ATM cell header to designate the virtual path on the physical ATM link.
- VCI: Virtual circuit identifier. Address or label contained in the ATM cell header to designate the virtual circuit within the virtual path on the physical ATM link
- ELAN: Emulated LAN. Following the ATM Forum specification, ELANs make connection-oriented ATM networks look like connectionless LANs.
- UBR: Unspecified bit rate. UBR is an ATM service category that does not specify traffic-related service guarantees. No numerical commitments are made with respect to the cell loss ratio or to the cell transfer delay.
- VBR: Variable bit rate. VBR is an ATM Forum-defined service category that supports variable bit rate data traffic with average and peak traffic parameters.
- PCR: Peak cell rate. The PCR, in cells/second, is the maximum cell rate.
- SCR: Sustainable cell rate. The SCR is an upper bound on the cell rate that is long relative to that of the PCR. Enforcement of this bound by the Usage Parameter Control allows the network to allocate sufficient resources, but less than those for the PCR, to ensure that the specified cell loss ratio can be achieved.
- MBS: Maximum burst size. The signaling method determines the MBS, which is coded as a number of cells, that can be transmitted at peak rate and still conform to the overall algorithm.

Data transmission (also called cell switching) through the ATM network relies on establishing logical connections between ATM devices. ATM is a connection-oriented service, which means that an ATM device cannot transmit information until it establishes a connection with a receiving device.

SONET terms and acronyms

This section provides a brief listing of common Synchronous Optical Network (SONET) terms. SONET is a medium for transmitting data that uses fiber optic cables.

The following terms and acronyms are frequently used with SONET information:

- SONET: Synchronous Optical Network. SONET is a family of fiber optic transmission rates that provides the flexibility to transport many digital signals with different capacities. This ANSI standard provides for transmission from OC-1 to OC-48 and greater.
- SDH: Synchronous Digital Hierarchy. SDH is a standard technology for optical fiber-based synchronous data transmission. SDH is the international equivalent of SONET.
- OC-3: Optical Carrier-level 3. OC-3 is an optical fiber transmission system at 155 Mb/s.
- OC-3c/STM-1: Optical Carrier-level 3 concatenation. OC-3c/STM-1 is an optical fiber transmission system that carries STS-3c/STM-1 frame structures at 155 Mb/s. Concatenation refers to the fact that there is only one logical data stream (rather than supporting a channelized structure).
- OC-12: Optical Carrier-level 12. OC-12 is an optical fiber transmission system at 622 Mb/s.
- OC-12c/STM-4: Optical Carrier-level 12 concatenation. OC-12c/STM-4 is an optical fiber transmission system that carries STS-12c/STM-4 frame structures at 622 Mb/s. Concatenation refers to the fact that there is only one logical data stream (rather than supporting a channelized structure).

SONET transmission rates

The following transmission rates are commonly used with SONET:

- OC-3c/STM-1: 155.52 Mb/s (and SDH/STM-1)
- OC-12c/STM-4: 622.08 Mb/s (and SDH/STM-4)

The SONET specification defines optical both as:

- Single-mode fiber (SMF)
- Multimode fiber (MMF)

Note: The estimated maximum transmission distance for OC-3c SMF is 20 kilometers (km); for OC-3c MMF is 2 km; for OC-12c SMF is 15 km; for OC-12c MMF is 500 m.

Chapter 3
Installing the Passport 8672ATME Module

This chapter describes the procedure for installing the Passport 8672ATME Module. It covers the following topics:

- "Safety and environmental precautions," next
- "Installing the Passport 8672ATME Module" on page 39
- "Verifying installation" on page 41
- "Initialization" on page 42
- "MDA insertion and configuration" on page 44
- "Replacing a module" on page 45

For more information about the Passport 8600 chassis, refer to the following documents:

- *Getting Started with Passport 8000 Series Management Software*
- *Installing the Passport 8600 Modules*

Safety and environmental precautions

Before you begin performing any installation or replacement procedure on the Passport switch, please note the following safe handling guidelines:

- To prevent damage caused by electrostatic discharge (ESD), handle the switch chassis and modules only when you, the chassis, and the chassis modules are properly grounded. Nortel Networks recommends the use of a grounding wrist strap.

- When handling modules, do not touch components on the modules; always handle modules by their edges. Store unused modules in their protective packaging.

Warning: Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Vorsicht: Glasfaserkomponenten können Laserlicht bzw. Infrarotlicht abstrahlen, wodurch Ihre Augen geschädigt werden können. Schauen Sie niemals in einen Glasfaser-LWL oder ein Anschlußteil. Gehen Sie stets davon aus, daß das Glasfaserkabel an eine Lichtquelle angeschlossen ist.

Avertissement: L'équipement à fibre optique peut émettre des rayons laser ou infrarouges qui risquent d'entraîner des lésions oculaires. Ne jamais regarder dans le port d'un connecteur ou d'un câble à fibre optique. Toujours supposer que les câbles à fibre optique sont raccordés à une source lumineuse.

Advertencia: Los equipos de fibra óptica pueden emitir radiaciones de láser o infrarrojas que pueden dañar los ojos. No mire nunca en el interior de una fibra óptica ni de un puerto de conexión. Suponga siempre que los cables de fibra óptica están conectados a una fuente luminosa.

Avvertenza: Le apparecchiature a fibre ottiche emettono raggi laser o infrarossi che possono risultare dannosi per gli occhi. Non guardare mai direttamente le fibre ottiche o le porte di collegamento. Tenere in considerazione il fatto che i cavi a fibre ottiche sono collegati a una sorgente luminosa.

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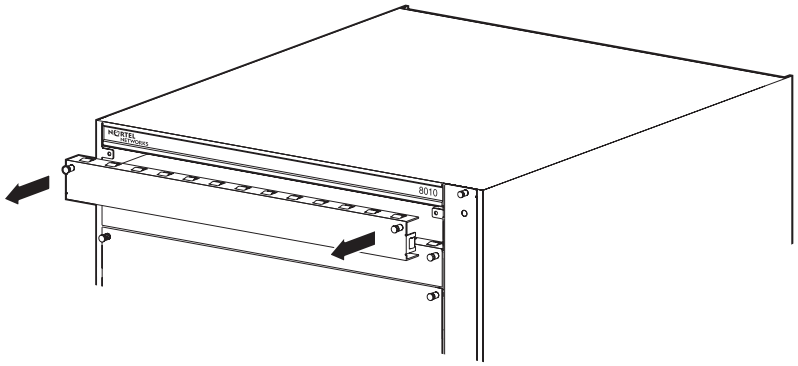
Installing the Passport 8672ATME Module

To install the Passport 8672ATME Module:

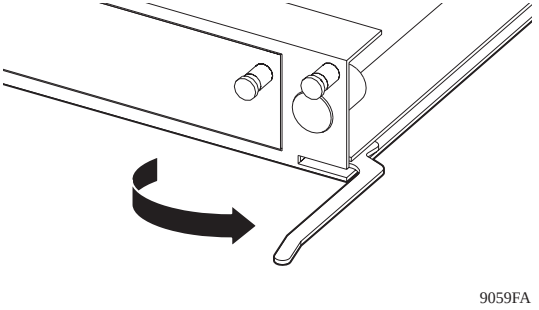
1 Remove the filler panel from the module slot in the Passport 8600 series chassis (Figure 5).

Figure 5 Removing the filler panel



2 Make sure the inserter/extractor levers are extended away from the Passport 8672ATME Module front panel (Figure 6).

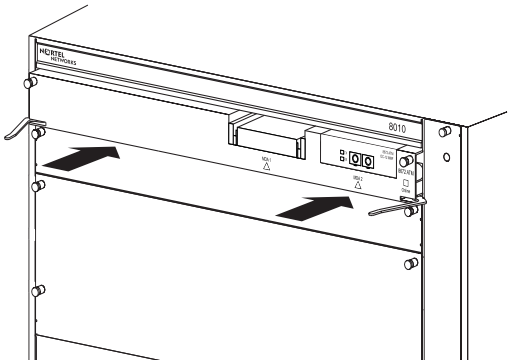
Figure 6 Extending the inserter/extractor levers



Note: Always handle an I/O module by the sides and carefully slide it out of the chassis. Place the module on a grounded work surface and in an antistatic bag for storage.

3 Handling the Passport 8672ATME Module by the sides only, carefully align it with the card guides in the chassis. Slide the module into the slot until the module connectors touch the chassis backplane (Figure 7).

Figure 7 Inserting the Passport 8672ATME Module



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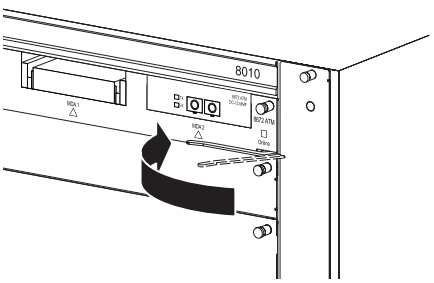
4 Rotate the inserter/extractor levers to seat the backplane connectors (Figure 8).

Figure 8 Closing the inserter/extractor levers



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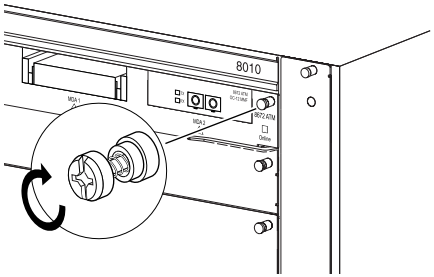
5 Tighten the retaining screws (Figure 9).

Figure 9 Tightening the retainer screws



You must install at least one MDA on the Passport 8672ATME Module in order to pass traffic. For instructions on installing MDAs, refer to *Installing Media Dependent Adapters for the Passport 8672ATME Module*.

For information on configuring and managing the Passport 8672ATME Module, refer to Chapter 4, “Managing the Passport 8672ATME Module with Device Manager,” on page 47, to Chapter 5, “Managing the Passport 8672ATME Module with the CLI,” on page 75, and to Chapter 6, “Configuring the Passport 8672ATME Module,” on page 117.

Verifying installation

The Passport 8672ATME Module front panel has an Online LED that indicates whether or not the module has power applied and is initialized correctly. For information on online LEDs, see “Online LED” on page 30.

Note: You cannot configure the Passport 8672ATME Module until the online LED on the module is steadily lit green and you have inserted at least one MDA.

Initialization

When the Passport 8672ATME Module is installed into a Passport 8600 series chassis, ensure that the switch fabric module (either the Passport 8690SF or Passport 8691SF module) in the same chassis has a PCMCIA card inserted and that the PCMCIA card contains the p80t3200.dld image, which supports the Passport 8672ATME Module. For more information about the PCMCIA slot and Passport 8690SF and Passport 8691SF modules, refer to the installation guide that came with your switch.

The switch fabric module (Passport 8690SF or Passport 8691SF) retrieves the image file p80t3200.dld to download to the Passport 8672ATME Module. First, the switch fabric module searches the host flash memory for the file, then the PCMCIA card. The switch fabric module downloads the image file to the Passport 8672ATME Module and identifies which MDAs are installed. The screen displays following message:

```
Using image = /slot/p80t3200.dld for ATM card download.
ATM card: Slot 4 MDA [OC-12c MM] [Quad OC-3c MM] Ver=2.2
```

If the image file is not found in either the flash memory or the PCMCIA, the system stops and the screen displays an error message such as:

```
ERROR Task=rcStart Couldn’t find an ATM download image!
Aborting card initialization in Slot=4
```

or:

```
ERROR Task=rcStart portPresent:port=X/X, invalid port Type
```

The Passport 8672ATME Module requests a redownload from the switch fabric module, and the screen displays the following message:

```
Redownload requested by ATM card in slot <number>.
```

If the image download is unsuccessful, the screen displays the following message:

```
ATM card in slot <number> not ready.
```

If there are three unsuccessful attempts to download, the screen displays the message shown in Figure 10.

Figure 10 Unsuccessful download screen output

```
Copyright (c)  1998-2001 Nortel Networks, Inc.
CPU Slot 6:    PPC 740 Map B
Version:       1.0.0.2/3
Creation Time: Jun 29 2000, 23:24:35
Hardware Time: AUG 09 2000, 14:02:57 UTC
Memory Size:   0x04000000
Start Type:    cold
CENTENNIAL    ATA
/flash/  - Volume is OK
Loaded boot configuration from file /flash/boot.cfg
Press <Return> to stop auto-boot...
/pcmcia/  - Volume is OK
2744752 to 12936388 (12936388)
Starting at 0x10000...
CENTENNIAL    ATA
Passport 8600 System Software Release REL3.1.0.0_B022
Copyright (c) 1996-2000 Nortel Networks, Inc.
Waiting for cpu in slot 5 ... 2 seconds
[08/09/00 14:03:13] System boot
/pcmcia/  - Volume is OK
[08/09/00 14:03:13] Passport System Software Release REL3.1.0.0_B022
[08/09/00 14:03:15] Card inserted: Slot=1 Type=8624FX
[08/09/00 14:03:15] Card inserted: Slot=2 Type=8648TX
[08/09/00 14:03:15] Card inserted: Slot=3 Type=8608SX
[08/09/00 14:03:15] Card inserted: Slot=4 Type=8608AT
[08/09/00 14:03:18] Initializing 8624FX in slot #1 ...
[08/09/00 14:03:19] Initializing 8648TX in slot #2 ...
[08/09/00 14:03:21] Initializing 8608SX in slot #3 ...
[08/09/00 14:03:24] Initializing 8608AT in slot #4 ...
/flash/  - Volume is OK
[08/09/00 14:03:30] ERROR Task=rcStart Couldn't find an ATM download
image! Aborting card initialization in Slot=4!
[08/09/00 14:03:30] Initialization of card failed for Slot 4 !
[08/09/00 14:03:30] Loading configuration from /flash/config.cfg
[08/09/00 14:03:30] The system is ready
[08/09/00 14:03:30] ERROR Task=rcStart smMsgSend: failed, DataLength
(0)too large
*******************************
* Nortel Networks, Inc.        *
* Copyright (c) 1996-2000      *
* All Rights Reserved          *
* Passport 8006                *
* Software Release REL3.1.0.0_B02
*******************************
Login: [08/09/00 14:04:15] Sending Cold-Start Trap
```

After the image loads onto the Passport 8672ATME Module, it performs a series of self-diagnostic tests. If the module fails the diagnostics, the screen displays the following message:

```
Fatal bring up error on ATM card in slot <number>.
```

If you see this message, contact a service representative. For information on contacting service representatives, refer to "How to get help" on page 24.

When the image successfully loads onto the Passport 8672ATME Module, the screen displays the following message:

```
ATM card in slot <number> is online.
```

The switch fabric module (Passport 8690SF or Passport 8691SF) can download the image to two Passport 8672ATME Modules in the same Passport 8600 series chassis simultaneously.

Note: If you accidentally delete the image file, reset the card and redownload the file. For information on how to reset the card, see "Resetting the module" on page 54.

If you have one MDA installed, you can proceed to configure the Passport 8672ATME Module.

Note: You must save your configuration (using either the CLI or Device Manager) to preserve the configuration changes you made to the Passport 8672ATME Module across reboots.

MDA insertion and configuration

Once you insert an MDA, you must complete some basic configuration tasks for the Passport 8672ATME Module to begin switching operations as soon as it completes initialization. For information on installing MDAs, refer to *Installing the Installing Media Dependent Adapters for the Passport 8672ATME Module.*

To verify that the Passport 8672ATME Module is ready to receive and transmit traffic, check the LEDs on the module and the MDA. Once you enable the ports using the CLI or Device Manager, the online LED on the module lights steady green, and the module is ready. See "Online LED" on page 30 and "MDA LEDs" on page 31.

For information on enabling ports, refer to "Editing port parameters" on page 58.

You configure and manage the Passport 8600 series switch operation for your network using the command line interface (CLI) or SNMP-based network management software, such as Device Manager. For information on configuring and managing the Passport 8672ATME Module, refer to Chapter 4, "Managing the Passport 8672ATME Module with Device Manager," on page 47, to Chapter 5, "Managing the Passport 8672ATME Module with the CLI," on page 75, and to Chapter 6, "Configuring the Passport 8672ATME Module," on page 117.

Factory default settings for the Passport 8672ATME Module are shown in Appendix B, "Factory defaults," on page 155.

Replacing a module

You can hot-swap Passport 8672ATME Modules as long as the module you are inserting has the same MDAs installed as the module you are replacing. In this case, the system saves the previous configurations. If you hot-swap the module with a module that has *different* MDAs installed, you must reconfigure the module.

If you are hot-swapping modules, read the following section for information about how the routing switch recognizes replacement modules and how to avoid potential problems.

Warning: The Passport 8672ATME Module itself is hot-swappable; the MDAs necessary to pass traffic on the module are *not* hot-swappable.

Starting the system after a module replacement

After you a replace a module on the chassis, you can expect the following results:

- In a running system, when you replace an I/O module with a module of the same type, the system restores the configuration of all the ports.
- When you replace a module with one of a different type, the system discards the configuration of the old ports, and the new ports are added to either the default VLAN or a null VLAN, depending on the operating mode of the switch.
- When you save the configuration in nonvolatile random access memory (NVRAM), turn off the switch, replace a module with a different module type, and turn the system on again, the system discards the configuration of the old ports, and adds new ports to either the default VLAN or an unassigned VLAN, depending on the operating mode of the switch.

Starting the system with an empty slot

When you save the configuration in NVRAM, shut down the system, remove a module, turn on the chassis *with that slot empty*, and then populate the slot with a module of the same type as the one previously there, the system is *not* able to restore the original configuration.

Chapter 4
Managing the Passport 8672ATME Module with Device Manager

Two management tools enable you to manage your Passport 8672ATME Module: Device Manager and the command line interface (CLI). You can also use the embedded Web-based management feature to monitor the 8672ATME Module.

This chapter contains information on these topics:

- "Port numbering," next
- "Device Manager" on page 48
- "Configuring and managing ATM" on page 51
- "Configuring ATM F5-OAM End-to-End Loopback" on page 70

Refer to Chapter 5, "Managing the Passport 8672ATME Module with the CLI" for information about managing your Passport 8672ATME Module with the CLI and monitoring the module with the Web-based management features.

Port numbering

You must install an MDA into the Passport 8672ATME Module in order to have connectivity. The module contains two slots for MDAs, and you can mix and match among the following MDAs, which are available in both SMF and MMF:

- 1-port OC-12c/STM-4
- 4-port OC-3c/STM-1

The management systems identify an interface by its slot number (in the Passport 8600 series chassis) and its port number, using the syntax slot number/port number (s/p). The Passport 8672ATME Module can contain up to eight ports when two 4-port MDAs are inserted. Port numbers 1 to 4 are reserved for the MDA in the left slot regardless of the actual physical number of ports. Port numbers 5 to 8 apply to the MDA in the right slot regardless of the actual physical number of ports.

For example, a Passport 8672ATME Module in the third slot of the Passport 8600 series chassis with an OC-12c/STM-4 MDA in the left slot and an OC-3c/STM-1 MDA in the right slot has the following port numbers for management and configuration:

- 3/1: OC-12c
- 3/5: OC-3c/STM-1, left port
- 3/6: OC-3c/STM-1, port second from left
- 3/7: OC-3c/STM-1, port second from right
- 3/8: OC-3c/STM-1, right port

As another example of port numbering, a Passport 8672ATME Module in the second slot of the chassis with two OC-12c/STM-4 MDAs installed has the following port numbers:

- 2/1: OC-12c/STM-4, left
- 2/5: OC-12c/STM-4, right

A Passport 8672ATME Module with two OC-3c/STM-1 MDAs installed has ports numbered consecutively 1 through 8, from left to right.

Device Manager

Passport Device Manager is an SNMP-based graphical user interface tool designed to manage single devices. In order to use Device Manager, you must have network connectivity to a management station running Device Manager on one of the supported platforms.

For detailed information on all aspects of installing and running Device Manager, refer to:

- *Getting Started with the Passport 8000 Series Switch Management Software*
- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using Device Manager Release 5.x.x*

The following sections describe the Device Manager features that are specific to the Passport 8672ATME Module:

- "Installing Device Manager," next
- "Configuring and managing ATM" on page 51
- "Configuring ATM F5-OAM End-to-End Loopback" on page 70
- "Displaying statistics using Device Manager" on page 73
- "Testing using Device Manager" on page 73

Device Manager access and passwords

For a complete discussion of Passport access levels and passwords, refer to *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using Device Manager Release 5.x.x.*

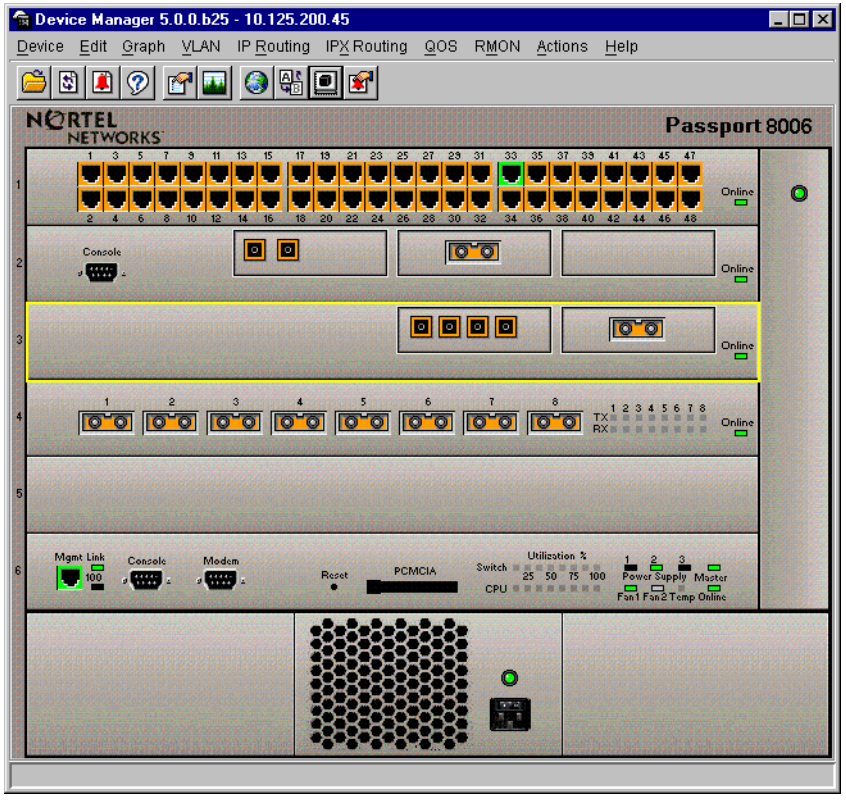
Installing Device Manager

To install Device Manager:

1. Download the Device Manager software from the CD.
2. Double-click the icon and follow the instructions on the screen.

   When you launch Device Manager, a graphical image of the Passport 8600 chassis with the Passport 8672ATME Module installed is displayed (Figure 11).

Figure 11 Passport 8000 series chassis with Passport 8672ATME Module



The ports on the graphical image are color-coded to provide at-a-glance port status. Table 3 shows the status assigned to each color.

Table 3 Device Manager port color codes

Field	Description
Green	Port is operating.
Red	Port has been manually disabled.
Orange	Port has no link.
Light blue	Port is in standby mode.
Dark blue	Port is being tested.
Gray	Port is unmanageable.

Additionally, many Device Manager windows and dialog boxes contain buttons. Table 4 describes the function of these buttons.

Table 4 Device Manager buttons

Field	Description
Apply	Applies the changes you entered to fields in a window or dialog box.
Refresh	Refreshes the information in the window. Each time you click Refresh, new information is polled form the switch and displays.
Close	Closes the window or dialog box and disregards any changes you made to fields.
Help	Does not function with the Passport 8672ATME Module.
Insert	Inserts or creates a new group, such as traps.
Resize Columns	Resizes column on the screen.

Note: You must always click Apply at the bottom of the tab to implement any changes you make.

Configuring and managing ATM

This section describes how to use Device Manager to configure and manage ATM, and includes the following topics:

- "Changing default settings" on page 52
- "Resetting the module" on page 54
- "Viewing MDA information" on page 56
- "Enabling or disabling a port" on page 57
- "Editing port parameters" on page 58
- "Editing ATM and framing parameters" on page 58
- "Editing circuit parameters" on page 60
- "Deleting a PVC" on page 63
- "Configuring ATM 1483 ELAN parameters" on page 64
- "Configuring ATM 1483 ELAN parameters" on page 64
- "Deleting an ATM 1483 ELAN" on page 69

Changing default settings

To change the default settings on the Passport 8000 Series switch or to perform any configuration tasks in Device Manager:

➔ On the device view, double-click on the port you want to configure.

The Port dialog box opens with the Interface tab displayed (Figure 12).

Figure 12 Interface tab—ATM

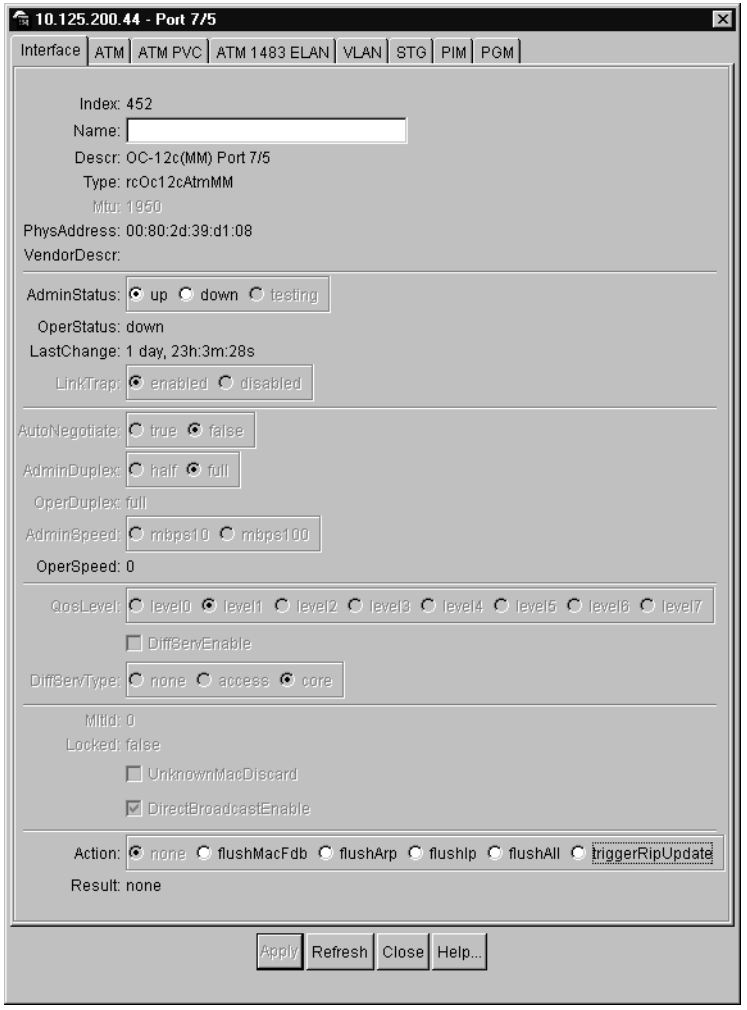


Table 5 describes the Interface tab fields.

Table 5 ATM Interface tab fields

Item	Description
Index	Unique value assigned to each interface. The value ranges between 16 and 255.
Name	Displays the name of this port. To assign or change a name to the port, highlight the field and enter alphanumeric characters.
Descr	Displays the port type of this interface, which may be: • OC-3c MMF or SMF • OC-12c MMF or SMF The card and port numbers are also shown.
Type	Displays the media type of this interface, which may be: • rcOc3cAtmSM • rcOc3cAtmMM • rcOc12cAtmSM • rcOc12cAtmMM
PhysAddress	MAC address assigned to a particular interface.
VendorDescr	Vendor description.
AdminStatus	Sets the port to either of the following states: • up • down When a managed system initializes, all interfaces start with AdminStatus in the down state. As a result of either management or configuration action, the AdminStatus is changed to the up state (or remains in the down state).
OperStatus	Displays the current operational state of the interface, either: • up • down If AdminStatus is down, then OperStatus should be down. If AdminStatus is changed to up, then OperStatus should change to up if the interface is ready to transmit and receive network traffic. It should remain in the down state if and only if there is a fault that prevents it from going to the up state.
LastChange	Displays the value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero.
OperSpeed	Displays the current operating speed of the ATM port. For OC-3c, the operating speed is 155.52 Mb/s; for OC-12c, it is 622.08 Mb/s.

Table 5 ATM Interface tab fields (continued)

Item	Description
UnknownMacDiscard	
DirectBroadcastEnable	
Action	Sets one of the following port-related actions: • none • flushMacFdb—flush MAC forwarding table for port • flushArp—flush ARP table for port • flushIp—flush IP route table for port • flushAll—flush all tables for port • triggerRipUpdate—manually update the RIP table
Result	Displays result from the last system action.

Resetting the module

To reset the module:

1. Highlight the module.
2. From the Device Manager menu bar, choose Edit > Card.

   The Card dialog box opens with the Card tab displayed (Figure 13).

Figure 13 Card tab

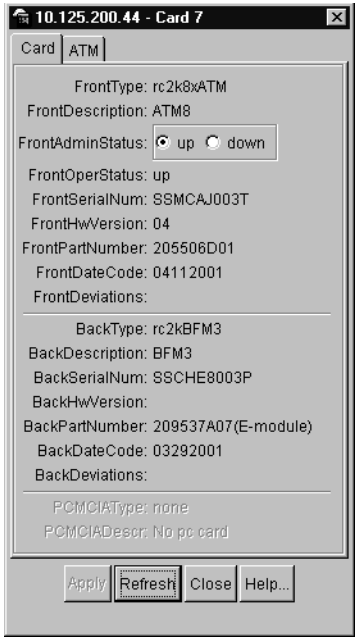


Table 6 describes the Card tab fields.

Table 6 Card tab fields

Field	Description
FrontType	Card type.
FrontDescription	ATM.
FrontAdminStatus	Administrative status of the card.
FrontOperStatus	Operational status of the card.
FrontSerialNum	Serial number of card.
FrontHWVersion	Hardware version.
FrontPartNumer	Part number.
FrontDateCode	Date code.
FrontDeviations	Deviations.
BackType	Card back type.
BackDescription	Description.
BackSerialNum	Serial Number.

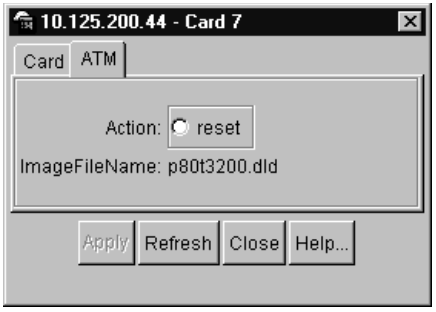
Table 6 Card tab fields (continued)

Field	Description
BackHWVersion	Hardware version.
BackPartNumer	Part number.
BackDateCode	Date code.
BackDeviations	Deviations.

3 Click the ATM tab.

The ATM tab opens (Figure 14).

Figure 14 ATM tab



4 Click reset.

5 Click Apply.

Viewing MDA information

To view information on the MDA you are using,

1 Highlight the MDA.

2 From the Device Manager menu bar, choose Edit > Mda.

The MDA dialog box opens (Figure 15).

Figure 15 MDA dialog box

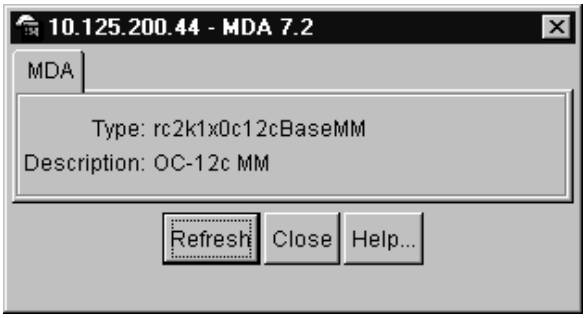


Table 7 describes the MDA dialog box fields.

Table 7 MDA dialog box fields

Field	Description
Type	Media type: • rc<XXXX>Oc3BaseSM. • rc<XXXX>Oc3BaseMM. • rc<XXXX>Oc12BaseSM. • rc<XXXX>Oc12BaseMM.
Description	MDA type: • Quad OC-3c SM — quad port OC-3c single-mode fiber. • Quad OC-3c MM — quad port OC-3c multimode fiber. • OC-12c SM — single port OC-12c single-mode fiber. • OC-12c MM — single port OC-12c multimode fiber.

Enabling or disabling a port

You can enable or disable a port by two methods. To enable or disable a port through the Device Manager menu bar:

1. On the device view, highlight a port.
2. From the Device Manager menu bar, choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 12).
3. In the AdminStatus area, click up to enable the port, or click down to disable the port.

4 Click Apply.

To enable or disable a port using a shortcut menu:

1 Right-click on the port.

A shortcut menu opens.

2 Choose Enable or Disable.

Editing port parameters

To view or change the general parameters of the port:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 12).

Editing ATM and framing parameters

To view or change the ATM and framing parameters of the port:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 12).

3 Click the ATM tab.

The ATM tab opens (Figure 16).

Figure 16 ATM tab

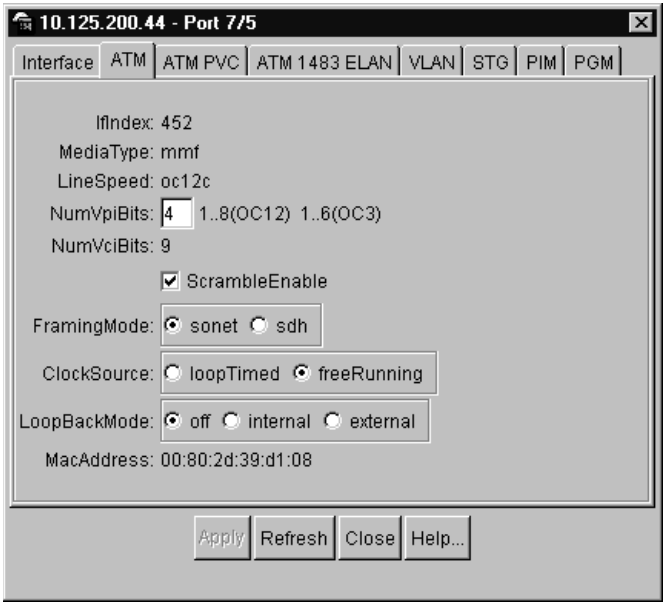


Table 8 describes the ATM tab fields.

Table 8 ATM tab fields

Item	Description
ifIndex	Interface Index.
MediaType	mmf (multimode fiber) or smf (single-mode fiber)
LineSpeed	For OC-3c, the operating speed is 155.52 Mb/s; for OC-12c, it is 622.08 Mb/s.
NumVpiBits	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c.
NumVciBits	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
ScrambleEnable	Sets the port to scramble the data by clicking the box.

Table 8 ATM tab fields (continued)

Item	Description
FramingMode	Sets the framing for the port to: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
ClockSource	Sets the clock source for the port to: • loopTimed, which means clocking is derived from the SONET line. • freeRunning, which means clocking is derived from the on-board clock. Note: If you have two connected Passport 8672ATME Modules, you must set both to freeRunning or one to freeRunning and one to loopTimed; do not set both to loopTimed.
LoopBackMode	Sets the loopback mode to: • off • internal • external
MacAddress	MAC address assigned to a particular interface.

Editing circuit parameters

To view and configure ATM PVC parameters:

1. On the device view, highlight a port.
2. From the Device Manager menu bar, choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 12).
3. Click the ATM PVC tab.

   The ATM PVC tab opens (Figure 17).

Figure 17 ATM PVC tab

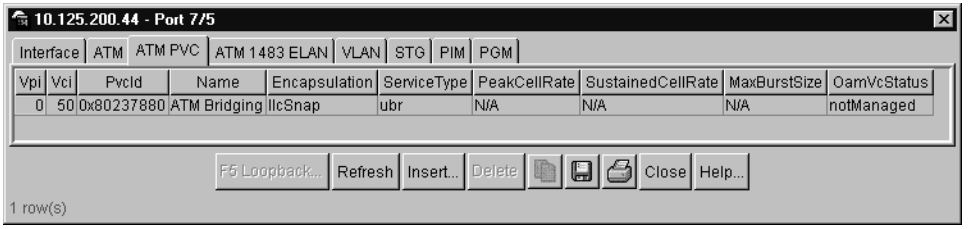


Table 9 describes the ATM PVC tab fields.

Table 9 ATM PVC tab fields

Item	Description
Vpi	Virtual path identifier**.**
Vci	Virtual circuit identifier.
PvcId	Internal index ID of the PVC.
Name	Emulated LAN name.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).
PeakCellRate	Peak cell rate, in cells/second, is the maximum cell rate. The valid ranges are: • OC-3—86..182783 • OC-12—86..733490 Note: IP multicast traffic between a Passport module and other devices may not perform as well as expected unless the peak cell rate and the sustained cell rate values are updated to their maximum values; only applicable if the Service Type is vbr.
SustainedCellRate	Sustainable cell rate is an upper bound on the cell rate that is long relative to that of the PCR; only applicable if the Service Type is vbr. The valid ranges are: • OC-3—86..182783 • OC-12—86..733490
MaxBurstSize	Maximum burst size determined by the signaling method; It is coded as a number of cells that can be transmitted at peak rate and still conform to the overall algorithm; only applicable if the Service Type is vbr.

4 Click Insert.

The Insert ATM PVC dialog box opens (Figure 18).

Figure 18 Insert ATM PVC dialog box

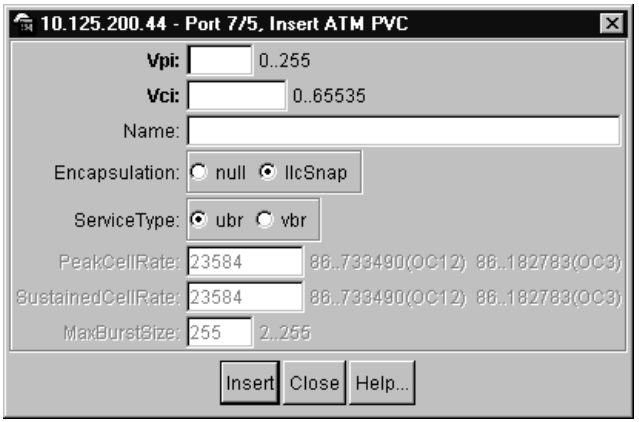


Table 10 describes the Port, Insert ATM PVC dialog box fields.

Table 10 Insert ATM PVC dialog box fields

Item	Description
Vpi	Numeric value.
Vci	Numeric value **Note:** For <vpi.vci>, 0.0 is not supported.
Name	Alphanumeric characters to assign a name to the PVC.
Encapsulation	Encapsulation type: null or llcSnap.
ServiceType	Unspecified bit rate (ubr) or variable bit rate (vbr).
PeakCellRate	Numeric value, within the range 86...733490; only applicable if the Service Type is vbr.
SustainedCellRate	Numeric value, within the range 86...733490; only applicable if the Service Type is vbr.
MaxBurstSize	Numeric value, within the range 2...255; only applicable if the Service Type is vbr.

5 In the Vpi field, type the VPI-bit size.

6 In the Vci field, type the VCI-bit size.

Note: For <vpi.vci>, 0.0 is not supported.

7 In the Name field, type the name of the ATM PVC.

8 In the Encapsulation field, select the encapsulation method (null or IIcSnap).

9 In the Service Type field, select the service type (ubr or vbr).

10 If you select vbr in the Service Type field:

- **a** In the PeakCellRate field, enter the PCR (an integer between 86 and 733490).
- **b** In the SustainedCellRate field, enter the SCR (an integer between 86 and 733490).
- **c** In the MaxBurstSize, type the maximum burst size (an integer between 2 and 255).

11 Click Insert.

The Insert ATM PVC dialog box closes.

12 Click Close.

Deleting a PVC

To delete a PVC:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

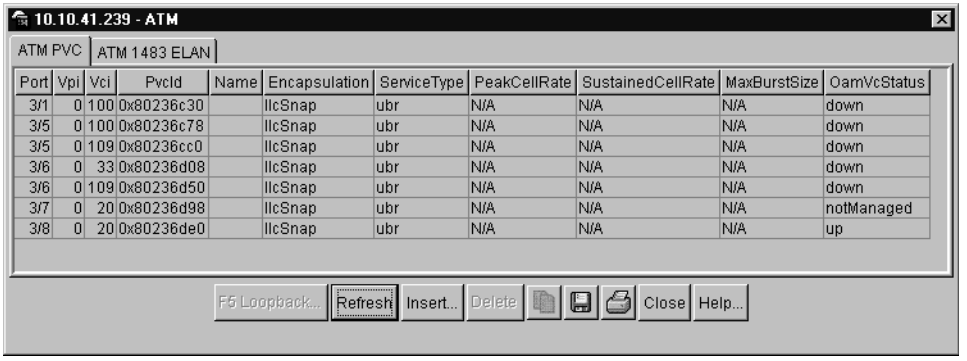
The Port dialog box opens with the Interface tab displayed (Figure 12).

3 Click the ATM PVC tab.

4 The ATM PVC tab opens.

5 Click a PvcId entry in the table for the PVC you want to delete.

Figure 19 ATM PVC tab with a PVC selected


10.10.41.239 - ATM
ATM PVC
ATM 1483 ELAN
Port Vpi Vci PvcId Name Encapsulation ServiceType PeakCellRate SustainedCellRate MaxBurstSize OamVcStatus
3/1 0 100 0x80236c30 llcSnap ubr N/A N/A N/A down
3/5 0 100 0x80236c78 llcSnap ubr N/A N/A N/A down
3/5 0 109 0x80236cc0 llcSnap ubr N/A N/A N/A down
3/6 0 33 0x80236d08 llcSnap ubr N/A N/A N/A down
3/6 0 109 0x80236d50 llcSnap ubr N/A N/A N/A down
3/7 0 20 0x80236d98 llcSnap ubr N/A N/A N/A notManaged
3/8 0 20 0x80236de0 llcSnap ubr N/A N/A N/A up
F5 Loopback...
Refresh
Insert...
Delete
Close
Help...

6 Click Delete.

The PVC is deleted.

Configuring ATM 1483 ELAN parameters

To view and configure ATM 1483 ELAN parameters for the port:

1 On the device view, highlight a port.

2 From the Device Manager menu bar, choose Edit > Port.

The Port dialog box opens with the Interface tab displayed (Figure 12).

3 Click the ATM 1483 ELAN tab.

The ATM 1483 ELAN tab opens (Figure 20).

Figure 20 ATM 1483 ELAN tab

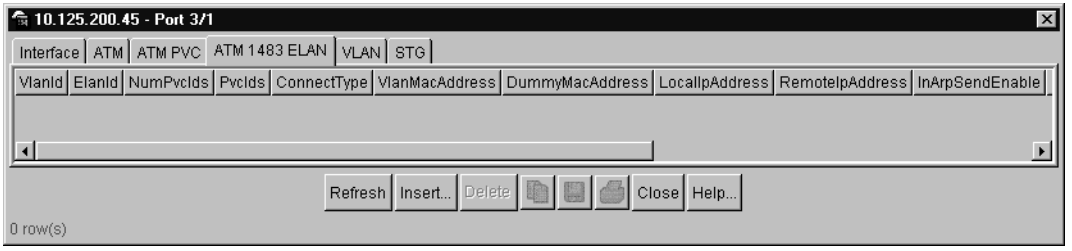


Table 11 describes the ATM 1483 ELAN tab fields.

Table 11 ATM 1483 ELAN tab fields

Field	Description
VlanId	VLAN to which the ELAN belongs.
ElanId	Internal ID of the ELAN.
NumPvcIds	Number of PVCs pairs used in the ELAN.
PvcIds	List of PVC IDs, minimum of 1 required.
ConnectType	Type of connection: bridged, IP or IPX.
VlanMacAddress	MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
DummyMacAddress	Dummy MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate source MAC to use.
LocalIpAddress	Local IP address for connection type IP.
RemoteIpAddress	Remote IP address for connection type IP.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP.
IpxVlanEncapMethod	One of the following: • llc • snap • ether-ii • raw
IpxNetworkNum	Network number; IPX only.
StgId	Spanning tree group ID. Only for bridge connection type.
rcStgTaggedBpduVlanId	VLAN ID used for tagging BPDUs.

4 Click Insert.

The Insert ATM 1483 ELAN dialog box opens (Figure 21).

Figure 21 Port, Insert ATM 1483 ELAN dialog box

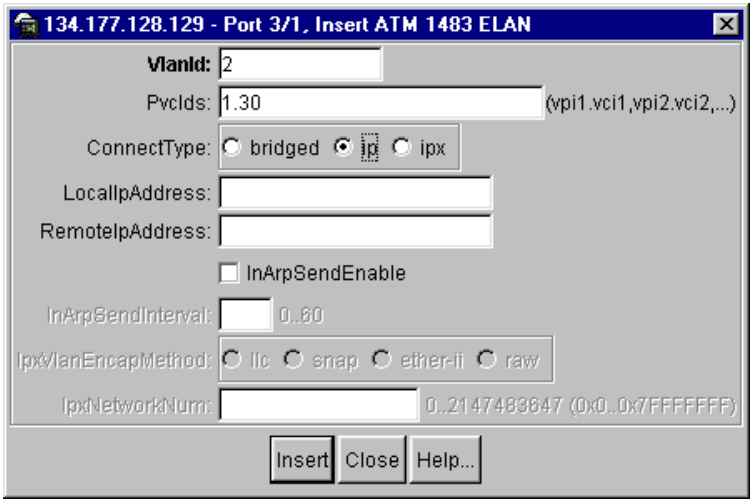


Table 12 describes the Insert ATM 1483 ELAN dialog box fields.

Table 12 Port, Insert ATM 1483 ELAN dialog box fields

Item	Description
VlanId	VLAN ID.
PvcIds	Value for Pvc IDs.
ConnectType	Types of connection: bridged, IP or IPX.
LocalIpAddress	IP address of the device.
RemoteIpAddress	IP address of the device to which you are connecting.
InArpSendEnable	Enables ARP sending on the ELAN for connection type IP.
InArpSendInterval	Interval of ARP sending for connection type IP.
IpxVlanEncapMethod	IPX encapsulation protocol: llc, snap, ether-ii, or raw.
IpxNetworkNum	Network number; numeric value, within the range 0...2147483647.

5 In the VlanId field, type the VLAN ID.

6 In the PvcIds field, type the PVC ID.

Note: For <vpi.vci>, 0.0 is not supported.

7 In the ConnectType field, select the type of routing protocol: bridged, ip, or ipx.

8 If bridged is selected in the ConnectType field, click Insert.

9 If Ip is selected in the ConnectType field, complete the following fields:

a In the LocalIpAddress field, type the IP address of the device.

b In the RemoteIpAddress field, type the IP address of the device that you are connecting to in the 1483 ELAN.

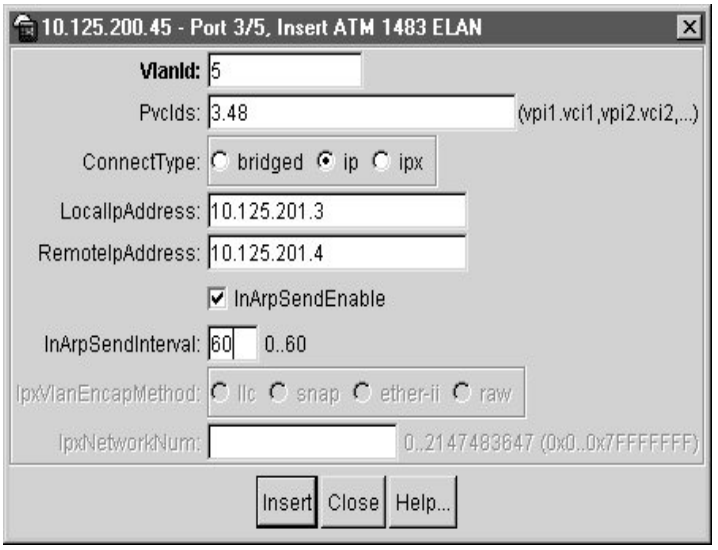
c Select the InArpSendEnable option to enable Arp packets.

d In the InArpSendInterval field, type the time interval between 0 and 60 seconds.

e Click Insert.

Figure 22 shows the relevant fields for IP routing.

Figure 22 Insert ATM 1483 ELAN dialog box for IP routing

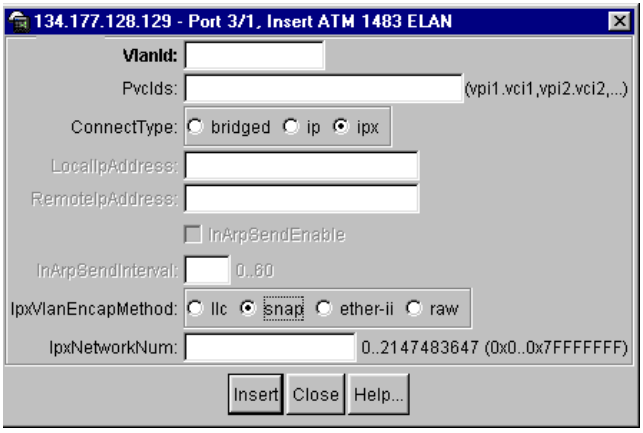


10 If Ipx is selected in the ConnectType field, complete the following fields:

- **a** In the IpxVlanEncapMethod, select the encapsulation method (llc, snap, ether-ii, or raw).
- **b** In the IpxNetworkNum field, enter the network number (an integer between 0 and 2147483647.
- **c** Click Insert.

Figure 23 shows the relevant fields for IPX routing.

Figure 23 Insert ATM 1483 ELAN dialog box for IPX routing



Deleting an ATM 1483 ELAN

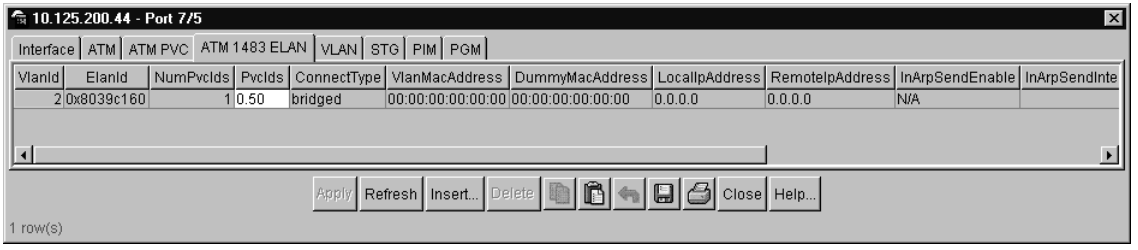
To delete an ATM 1483 ELAN:

1. On the device view, highlight a port.
2. From the Device Manager menu bar, choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 12).
3. Click the ATM 1483 ELAN tab.

   The ATM 1483 ELAN tab opens (Figure 24).

Figure 24 ATM 1483 ELAN tab with ElanId selected



4. Select the ATM 1483 ELAN to be deleted by clicking the ElanId entry in the table.

   Figure 24 shows a highlighted ElanId entry.

5 Click Delete.

The ATM 1483 ELAN is deleted.

Configuring ATM F5-OAM End-to-End Loopback

A Passport 8672ATME Module, by default, replies to ATM F5-OAM Loopback requests received. However, the transmission of F5-OAM Loopback requests and the processing of F5-OAM Loopback replies received require enabling this feature on a PVC by PVC basis. It is recommended that you enable ATM F5-OAM on all the PVCs configured on the PP8672 ATM port, in order for upper layer protocols such as MLT and OSPF to be immediately aware of the port down status or link failures.

You can configure the ATM F5-OAM End-to-End Loopback parameters with Device Manager or the CLI. For information on how to configure this feature with the CLI, see "Managing the Passport 8672ATME Module with the CLI" on page 75.

This section contains the following topics:

- "Enabling and defining ATM F5-OAM parameters," next
- "Displaying F5 Loopback statistics" on page 72

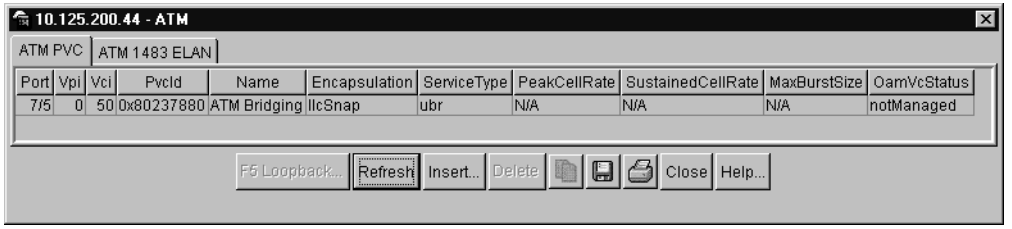
Enabling and defining ATM F5-OAM parameters

To enable and define the parameters of the ATM F5-OAM Loopback feature in Device Manager:

1 From the Device Manager menu bar choose Edit > ATM.

The ATM dialog box opens with the ATM PVC tab displayed (Figure 25).

Figure 25 ATM PVC dialog box—ATM PVC tab



2 Highlight a PVC.

3 Click F5 Loopback.

The F5 Loopback dialog box opens with the F5 Loopback tab displayed (Figure 26).

Figure 26 F5 Loopback dialog box

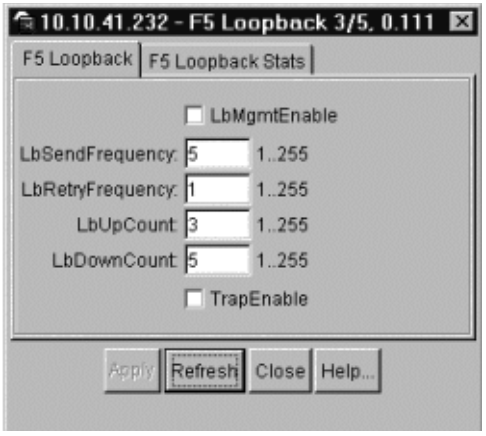


Table 13 describes the F5 Loopback tab fields.

Table 13 F5 Loopback tab field descriptions

Field	Description
LbMgmtEnable	Click to enable or disable the F5-OAM Loopback feature.
LbSendFrequency	Enter the number of seconds (1-255) between transmitting OAM loopback requests. The default value is 5 seconds.
LbRetryFrequency	Enter the number of seconds (1-255) between attempting to resend the transmission. The default value is 1 second.

Table 13 F5 Loopback tab field descriptions (continued)

Field	Description
LbUpCount	Enter the number of consecutive end-to-end F5-OAM loopback cell responses (1-255) that must be received in order to change a PVC connection state to up. The default value is 3 responses.
LbDownCount	Enter the number of consecutive end-to-end F5-OAM loopback cell responses (1-255) to be not received in order to change a PVC state to down. The default value is 5 responses (not received).
TrapEnable	Click to enable or disable OAM traps. When enabled, a trap is sent to the management station when rc2kAtmPvcOamVcStatus is going up or down.

Displaying F5 Loopback statistics

To display F5 Loopback statistics:

1. From the Device Manager menu bar choose Edit > ATM.

   The ATM dialog box opens with the ATM PVC tab displayed (Figure 18).

2. Highlight a PVC.

3. Click F5 Loopback.

   The F5 Loopback dialog box opens with the F5 Loopback tab displayed (Figure 26).

4. Click the F5 Loopback Stats tab.

   The F5 Loopback Stats tab is displayed (Figure 27).

Figure 27 F5 Loopback Stats tab

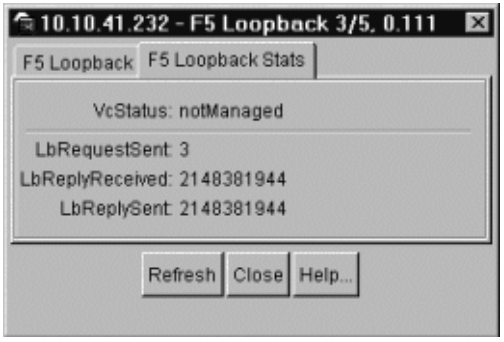


Table 14 describes the fields in the F5 Loopback Stats tab.

Table 14 F5 Loopback Stats tab fields

Field	Description
VcStatus	This field indicates the status of the PVC link. • notManaged—VC is not being managed by OAM • Down Verify—An OAM loopback failed. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify that the VC is down. After down-count unsuccessful retries, the VC goes to the down state (see LbDownCount in Table 13). • Down—VC has not received responses to end-to-end F5-OAM loopback cells. • Up Verify—An OAM loopback was successful. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Up state (see LbUpCount in Table 13). • Up—End-to-end loopbacks are successful.
LbRequestSent	Number of OAM loopback requests sent.
LbReplyReceive	Number of OAM loopback replies sent.
LbReplySent	Number of OAM loopback replies received.

Displaying statistics using Device Manager

Statistics are not supported in Device Manager in this release. See the "show ports stats atmport command" on page 94 for information on statistics in the CLI.

Testing using Device Manager

Testing is not supported in this release.

Chapter 5
Managing the Passport 8672ATME Module with the CLI

You can manage your Passport 8672ATME Module through the command line interface (CLI). You can also use the embedded Web-based management feature to monitor the 8672ATME Module.

Refer to Chapter 4, “Managing the Passport 8672ATME Module with Device Manager” for information about port numbering and managing your Passport 8672ATME Module through Device Manager.

This chapter contains the following topics:

- “Configuration commands,” next
- “Module commands” on page 76
- “1483 ELAN statistics” on page 77
- “Port commands” on page 79
- “Show commands” on page 85
- “Configuring ATM F5-OAM End-to-End Loopback” on page 111
- “Displaying packet loss counters” on page 116

Configuration commands

This section describes the CLI configuration commands available with the Passport 8672ATME Module. There are three types of configuration commands:

- "Module commands," next
- "1483 ELAN statistics" on page 77
- "Port commands" on page 79

Note: If you replace one card with another type of card, Nortel Networks recommends that you go to the root level of the CLI directory before using any CLI commands.

Module commands

The module commands allow you to:

- Reset the module
- View ELAN statistics
- Display the image filename for the Passport 8672ATME Module.

The syntax is:

`config atmcard <atmslot number>`

The required variable <*atmslot number*> is the slot number of the module in the Passport 8600 chassis. Table 15 describes the parameters and variables for the `config atmcard` command.

Table 15 config atmcard command parameters and variables

Parameters and variables	Description
`card-reset`	Resets the card.
`elan-stats <enable|disable>`	Enables collection of ELAN statistics.
`info`	Displays the image filename for the module.

1483 ELAN statistics

The 1483 ELAN statistics commands allow you to collect ELAN statistics for an ATM port. The commands are:

- `config atmcard <slot_number> elan-stats <enable|disable>`
- `clear atm elan-stats <vlan_id>`
- `show atm elan-stats <vlan_id>`

config atmcard elan-stats

The collection of ELAN statistics is disabled by default to avoid slowing data forwarding performance. ELAN statistics should be disabled after collection.

Enabling or disabling the collection of ELAN statistics does not clear the ELAN statistics counters. This allows the ELAN statistics to be reviewed after the feature is disabled.

clear atm elan-stats <vlan id>

This command allows you to clear statistics for a particular VLAN ID.

The syntax is:

`clear atm elan-stats <vlan_id>`

show atm elan-stats <vlan id>

Use this command to display the ELAN statistics for a particular VLAN ID. If the collection of ELAN statistics is disabled, a message is printed before the ELAN statistics.

Figure 29 shows sample output from the `show` **`atm elan-stats <`*`vlan_id`*`>`** command.

Figure 28 show atm elan-stats command output

```
 Passport-8610:5# show atm elan-stats 7
=========================================================================
                              ATM ELAN STATISTICS
=========================================================================
InOctets:           3208404820   InErrors:          0   InDiscards:          0
OutOctets:           3208281916  OutErrors:          0  OutDiscards:         0
 InUcastPkts:     130202   InMcastPkts:        395   InBCastPkts:   59134772
OutUcastPkts:     129406  OutMcastPkts:        391  OutBCastPkts:   59133296
```

Table 16 describes the information fields for the `show atm elan-stats` command.

Table 16 Information fields for the show atm elan-stats command

Field	Description
InOctets	Octets received from the ATM interface. This includes the “InDiscards" PDUs.
OutOctets	Octets transmitted out of the ATM interface. **NOTE**: For a Bridge ELAN Type with multiple PVCs, there will be multiple packets transmitted for a multicast packet, or for a unicast packet that is not in the CAM. Thus, the OutOctets may not correlate to the OutUcastPkts + OutMcastPkts + OutBcastPkts.
InErrors	AAL5 CPCS PDUs received with errors from the ATM interface. These errors include CRC-32 errors, SAR time-out errors, and oversized SDU errors.
OutErrors	Number of AAL5 CPCS PDUs that could not be transmitted due to error.

Table 16 Information fields for the show atm elan-stats command (continued)

Field	Description
InDiscards	Number of received AAL5 CPCS PDUs discarded.
OutDiscards	Ethernet packets discarded.
InUcastPkts	Number of unicast packets received on the ELAN.
OutUcastPkts	Number of unicast packets transmitted on the ELAN.
InMcastPkts	Number of Multicast packets received on the ELAN.
OutMcastPkts	Number of Multicast packets transmitted on the ELAN.
InBcastPkts	Number of broadcast packets received on the ELAN.
OutBcastPkts	Number of broadcast packets transmitted on the ELAN.

clear atm elan-stats

Use this command to clear the ELAN statistics for a particular VLAN ID. The syntax is:

```
clear atm elan-stats <vlan_id>
```

Port commands

The port commands allow you to perform general configuration on the Passport 8672ATME Module. The port config commands are:

- `config atm <ports>`
- `config atm <ports> pvc`
- `config atm <ports> pvc 1483 {bridged|ip|ipx}`
- `config atm <ports> info`

config atm command

Table 17 describes the parameters and variables for the `config atm <ports>` command.

Table 17 config atm command parameters and variables

Parameters and variables	Description
action <action choice>	Flushes a MAC, ARP, or IP table or triggers a RIP update. Choices are: • none • flushMacFdb • flushArp • flushIp • flushAll • triggerRipUpdate
number-vpi-bits <number-vpi-bits>	• Sets the number of bits used to represent VPI. Enter integer from 0 to 8. • For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. • For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c.
scrambling <enable | disable>	Enables or disables scrambling.
framing-mode <sonet | sdh>	Sets the framing to: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
clock-source <loop-timed | free-running>	Sets the transmit clock source to: • loop-timed, which means clocking is derived from line. • free-running, which means clocking is derived from on-board clock. Note that if you have two connected Passport 8672ATME Modules, you must set both to free-running or one to loop-timed and one to free-running; do not set both to loop-timed.
loop-back-mode <off | internal | remote>	Sets the loopback mode to: • off • internal • external

Table 17 config atm command parameters and variables (continued)

Parameters and variables	Description
state <enable | disable>	Sets the state of the port to enabled or disabled.
info	Shows the last saved port settings and the next-level CLI commands. Note that this does not show the current settings, but the last saved settings.

config atm pvc command

Table 18 describes the parameters and variables for the `config atm pvc` command.

Table 18 config atm pvc command parameters and variables

Parameters and variables	Description
create < vpi.vci> [name <value>] [enc <value>] [serv <value>] [pcr <value>] [scr <value>] [mbs <value>]	Creates a PVC. The required parameters are: • vpi is the circuit VPI. Enter a numeric value, within the range. • vci is the circuit VCI. Enter a numeric value, within the range. For OC-3c, 11 bits split between Vpi and Vci. Vpi bits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between Vpi (default is 4) and Vci (default is 9). Vpi bits cannot exceed 8 bits for OC-12c. Note: For <vpi.vci>, 0.0 is not supported. The optional parameters are: • name is the display string. Enter up to 256 alphanumeric characters to name PVC. • enc is the 1483 encapsulation method, either null or llc-snap. • serv is the bit rate, either ubr or vbr. • pcr, with VBR only, is the peak cell rate. The valid ranges are: OC-3—86..182783 OC-12—86..733490 • scr, with VBR only, is the sustained cell rate. The valid ranges are: OC-3—86..182783 OC-12—86..733490 • mbs, with VBR only, is the maximum burst size. Enter an integer from 2 to 255. Note that no VLANs or ELANs are bound to this PVC until you add VLAN membership using the config atm <ports> pvc 1483 commands.

Table 18 config atm pvc command parameters and variables (continued)

delete <vpi.vci>	Deletes the specified PVC. Note that this command will fail if the PVC is still being used by RFC 1483 traffic.
info [<ports>]	Displays PVC information.

config atm pvc 1483 command

Use the `config atm pvc 1483` commands to configure 1483 parameters on the Passport 8672ATME Module. The syntax is:

- config atm <ports> pvc 1483 bridged
- config atm <ports> pvc 1483 ip
- config atm <ports> pvc 1483 ipx

Table 19 describes the parameters and variables for the `config atm <ports> pvc 1483` command.

Table 19 config atm pvc 1483 bridged command parameters and variables

Parameters and variables	Description
add <vid> <vpi.vci> [,<vpi.vci>]...	Adds a number of PVCs to the specified 1483 ELAN. The required parameters are: • vid means VLAN ID number. • vpi.vci means circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note: This command fails if the specified VIDs or VPI/VCI pairs belong to another ELAN or already exist on this ELAN.
create <vid> <vpi.vci> [,<vpi.vci>]...	Creates a 1483 ELAN consisting of the specified PVCs. The required parameters are: • vid means VLAN ID number. • vpi.vci means circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note: This command fails if the specified VIDs or VPI/VCI pairs belong to another ELAN or already exist on this ELAN.
delete <vid>	Deletes the specified ELAN.

Table 19 config atm pvc 1483 bridged command parameters and variables (continued)

remove <vid> <vpi.vci> [,<vpi.vci>]...	Removes a number of PVCs from the specified 1483 ELAN. The required parameters are: • vid means VLAN ID number. • vpi.vci means circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. Note that this command fails if the PVCs are not present.
info	Displays information on 1483 ELANs.

Table 20 describes the parameters and variables for the `config atm pvc 1483 ip` command.

Table 20 config atm pvc 1483 ip command parameters and variables

Parameters and variables	Description
create <vid> <vpi.vci> <remoteip>	Creates a routed 1483 IP circuit on the specified VLAN to the specified remote router interface. The optional parameters are: • vid means VLAN ID number. • vpi.vci means circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. • remoteip is the IP address of the remote router interface. Note that the VLAN ID can exist *only* on this port.
delete <vid>	Deletes the routed 1483 IP circuit on the specified VLAN.
info	Displays information on routed 1483 IP circuits.

Table 21 describes the parameters and variables for the `config atm pvc 1483 ipx` command.

Table 21 config atm pvc 1483 ipx command parameters and variables

Parameters and variables	Description
create <vid> <vpi.vci> <ipx>	Creates a routed 1483 IPX circuit on the specified VLAN to the specified remote router interface. The optional parameters are: • vid means VLAN ID number. • vpi.vci means circuit VPI number and the circuit VCI numbers, respectively; they are separated by a period. • ipx is the IPX Network number of the remote router interface. If this number is not given, the first IPX Network number configured for the specified VLAN is used. Note that the VLAN ID must be previously configured for IPX on this port. No ARP functionality is available on this IPX segment.
delete <vid>	Deletes the routed 1483 IPX circuit on the specified VLAN.
info	Displays information on routed 1483 IPX circuits.

config atm info command

Figure 29 shows a sample of the output resulting from executing the `config atm info` command.

Figure 29 Sample output for the config atm info command

```
            number-vpi-bits : 4
                              scrambling : Enable
                             framing-mode : SONET
                             clock-source : Free Running
                            loop-back-mode : off
                                     state : up
```

Show commands

This section discusses the CLI show commands available with the Passport 8672ATME Module. These commands allow you to view information about the module:

```
show ports info atm all [<ports>]
show ports info atm fdb
show ports info atm ports [<ports>]
show ports info atm pvc [<ports>]
show ports info atm 1483 [<ports>]
show ports stats atmport [<ports>]
show ports stats atm felinecurrent [<ports>]
show ports stats atm felineinterval <intervalid> [<ports>]
show ports stats atm fepathcurrent [<ports>]
show ports stats atm fepathinterval <intervalid> [<ports>]
show ports stats atm linecurrent [<ports>]
show ports stats atm lineinterval <intervalid> [<ports>]
show ports stats atm pathcurrent [<ports>]
show ports stats atm pathinterval <intervalid> [<ports>]
show ports stats atm sectioncurrent [<ports>]
show ports stats atm sectioninterval <intervalid> [<ports>]
show ports stats atm sonetmediumtbl [<ports>]
```

Refer to *Reference for the Passport 8000 Series Command Line Interface Switching Operations*, and *Reference for the Passport 8000 Series Command Line Interface Routing Operations* for a complete list of CLI show commands.

show ports info atm all command

This command displays information (Figure 31) about the configuration for the specified port or for all ports. The command uses the syntax:

```
show ports info atm all [<ports>]
```

Figure 30 show ports info atm all command output

```
Passport-8610:5/show/ports/info/atm# all
=======================================================
                      ATM Port Configuration
=======================================================
PORT     MDA       SCRAMBLE FRAMING MAX-BITS CLOCK  LOOPBACK ADMIN
NUM   DESCRIPION    ENABLE   MODE   VPI VCI  SOURCE   MODE STATE STATUS
-------------------------------------------------------------------------
3/1   OC-12c MM     enable  SONET   4   9    free   off      up up
3/5   Quad OC-3c MM enable  SONET   2   9    free   off      up up
3/6   Quad OC-3c MM enable  SONET   2   9    free   off      up down
3/7   Quad OC-3c MM enable  SONET   4   7    free   off      up down
=========================================================================
                                ATM PVC
=========================================================================
PORT    PVC             SERVICE
NUM   VPI.VCI   ENCAPS    TYPE
-------------------------------------------------------------------------
3/1   0.100     llc-snap  UBR
3/1   3.200     llc-snap  UBR
3/6   0.33      llc-snap  UBR
3/6   3.90      llc-snap  UBR
=========================================================================
                              1483 Bridged
=========================================================================
PORT  VLAN    PVC
NUM    ID     LIST
-------------------------------------------------------------------------
3/1   6       0.100
3/8   4       3.40,4.50
=========================================================================
                              1483 IP
=========================================================================
PORT  VLAN      PVC        VLAN           LOCAL           REMOTE
NUM    ID     VPI.VCI   MAC ADDRESS       IP ADDRESS      IP ADDRESS
-------------------------------------------------------------------------
3/6 7       0.100     00:e0:7b:7b:52:01 10.10.80.239    10.10.80.230
=========================================================================
                              1483 IPX
=========================================================================
PORT  VLAN      PVC        VLAN           IPX NETWORK  IPX
NUM    ID     VPI.VCI   MAC ADDRESS         NUMBER     ENCAP
-------------------------------------------------------------------------
3/5   17      0.100     00:e0:7b:7b:52:03 10-11Xethernet-ii
Passport-8610:5/show/ports/info/atm# all
```

Table 22 describes the information fields for the `show ports info atm all` command.

Table 22 Information fields for the show ports info atm all command

Field	Description
PORT NUM	Port number.
MDA DESCRIPTION	This field describes the MDA: • Quad OC-3c SM — quad port OC-3c single-mode fiber • Quad OC-3c MM — quad port OC-3c multimode fiber • OC-12c SM — single port OC-12c single-mode fiber • OC-12c MM — single port OC-12c multimode fiber
SCRAMBLE ENABLE	Parameter that enables/disables the scrambling option.
FRAMING MODE	Indicates the framing for the port, either: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
MAX-BITS VPI	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c.
MAX-BITS VCI	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
CLOCK SOURCE	Indicates whether the Clock Source is either: • line • internal
LOOPBACK MODE	Indicates the loopback mode:: • off • internal • external
ADMIN STATE	Indicates the Admin State of the port, either: • up • down
STATUS	Indicates the status of the port, either: • up • down

Table 22 Information fields for the show ports info atm all command (continued)

Field	Description
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
ENCAPS	Encapsulation methods: either null, or llc-snap.
SERVICE TYPE	Unspecified bit rate (ubr) or variable bit rate (vbr).
VLAN ID	VLAN name to which the ELAN belongs.
PVC LIST	List of permanent virtual circuits.
VLAN MAC ADDRESS	The MAC address assigned to this VLAN (used in IP and IPX routed circuits when there is no appropriate destination MAC to use).
LOCAL IP ADDRESS	The local Ip address for connection type IP.
REMOTE IP ADDRESS	The remote Ip address for connection type IP.
IPX NETWORK NUMBER	Network number.
IPX ENCAP	Encapsulation method: llc, snap, ether-ii or raw.

show ports info atm fdb command

This command displays information (Figure 31) about the Forwarding Data Base (FDB) for the 1483 bridged point to multi-point PVCs. The FDB stores the information that it learns in the Passport 8672ATME Module.

In a point to multi-point connection, the Passport 8672ATME Module uses the FDB table to determine which PVC to use in the egress direction. The command uses the syntax:

```
show ports info atm fdb
```

Figure 31 show ports info atm fdb command output

```
Passport-8610:5/show/ports/info/atm# fdb
=============================================================
                        ATM ON BOARD CAM ENTRY
=============================================================
PORT        VLAN          VLAN               PVC             AGE
NUM         ID         MAC ADDRESS         VPI.VCI          TIME
-------------------------------------------------------------------------
3/1         2          00.00.00.00.03      0.100            5
```

Table 23 describes the information fields for the `show ports info atm fdb` command.

Table 23 Information fields for the show ports info atm fdb command

Field	Description
PORT NUM	Port number.
VLAN ID	VLAN number.
VLAN MAC ADDRESS	The destination MAC address.
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
AGE TIME	The time that elapsed since the MAC address was last used.

show ports info atm ports command

This command displays information (Figure 32) about the configuration of ATM ports. The command uses the syntax:

```
show ports info atm ports
```

Figure 32 show ports info atm ports command output

```
Passport-8610:5/show/ports/info/atm# ports
================================================================================
                          ATM Port Configuration
================================================================================
PORT     MDA       SCRAMBLE FRAMING MAX-BITS CLOCK  LOOPBACKADMIN STATUS
NUM   DESCRIPION    ENABLE   MODE   VPI VCI  SOURCE   MODE STATE
--------------------------------------------------------------------------------
3/1   OC-12c MM     enable  SONET   4   9    free   off      up      up
3/5   Quad OC-3c MM enable  SONET   2   9    free   off      up      up
3/6   Quad OC-3c MM enable  SONET   2   9    free   off      up      down
3/7   Quad OC-3c MM enable  SONET   4   7    free   off      up      up
3/8   Quad OC-3c MM enable  SONET   4   7    free   off      up      up

Passport-8610:5/show/ports/info/atm#
```

Table 24 describes the information fields for the `show ports info atm ports` command.

Table 24 Information fields for the show ports info atm ports command

Field	Description
PORT NUM	Port number.
MDA DESCRIPTION	This field describes the MDA: • Quad OC-3c SM — dual port OC-3c single-mode fiber • Quad OC-3c MM — dual port OC-3c multimode fiber • OC-12c SM — single port OC-12c single-mode fiber • OC-12c MM — single port OC-12c multimode fiber
SCRAMBLE ENABLE	Parameter that enables/disables the scrambling option.
FRAMING MODE	Indicates the framing for the port, either: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
MAX-BITS VPI	For OC-3c, 11 bits split between NumVpiBits and NumVciBits. NumVpiBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c.

Table 24 Information fields for the show ports info atm ports command (continued)

Field	Description
MAX-BITS VCI	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
CLOCK SOURCE	Indicates whether the Clock Source is either: • line • internal
LOOPBACK MODE	Indicates the loopback mode: • off • internal • external
ADMIN STATE	Indicates the Admin State of the port, either: • up • down
STATUS	Indicates the status of the port, either: • up • down

show ports info atm pvc command

This command displays information (Figure 33) about the permanent virtual circuits (PVCs) for the specified port or for all ports. The command uses the syntax:

```
show ports info atm pvc [<ports>]
```

Figure 33 show ports info atm pvc command output

```
Passport-8610:5/show/ports/info/atm# pvc
=========================================================================
                                  ATM PVC
=========================================================================
PORT     PVC                SERVICE     F5      OAM      SEND  RETRY   UP    DOWN
NUM    VPI.VCI    ENCAPS     TYPE      OAM     TRAP     FREQ  FREQ   COUNT  COUNT
-------------------------------------------------------------------------
3/1     0.100     llc-snap     UBR     disable   disable    5     1      3      5
3/1     3.200     llc-snap     UBR     enable    disable    5     1      3      5
3/6     0.33      llc-snap     UBR     disable   disable    5     1      3      5
3/6     3.90      llc-snap     UBR     enable    disable   10     3      3      5
3/8     3.40      llc-snap     UBR     enable    enable     5     2      5      5
3/8     4.50      llc-snap     UBR     disable   disable    5     1      3      5
3/8     7.100     llc-snap     UBR     disable   disable    5     1      3      5

Passport-8610:5/show/ports/info/atm#
```

Table 25 describes the information fields for the `show ports info atm pvc` command.

Table 25 Information fields for the show ports info atm pvc command

Field	Description
PORT NUM	Port number.
PVC VPI.VCI	Permanent virtual circuit and the associated vpi and vci numeric identifiers.
ENCAPS	Encapsulation method: null or llc-snap.
SERVICE TYPE	Unspecified bit rate (ubr) or variable bit rate (vbr).
F5 OAM	Status of F5-OAM Loopback feature: enable or disable.
OAM TRAP	Status of the SNMP Trap when the F5-OAM Loopback changes from the DOWN VERIFY to DOWN state or from the UP VERIFY to UP state: enable or disable.
SEND FREQ	Transmission rate (in seconds) of F5-OAM Loopback requests.
RETRY FREQ	Retry-transmission rate (in seconds) of F5-OAM Loopback requests.
UP COUNT	Number of consecutive F5-OAM Loopback replies that must be received to change the Loopback State to “up.”
DOWN COUNT	Number of consecutive F5-OAM Loopback replies that must fail to change the Loopback State to “down.”

show ports info atm 1483 command

This command displays information (Figure 34) about 1483 circuits for the specified port or for all ports. The command uses the syntax:

`show ports info atm 1483 [<ports>]`

Figure 34 show ports info atm 1483 command output

```
Passport-8610:5# show ports info atm 1483 3/8
================================================================
                          1483 Bridged
================================================================
PORT  VLAN    PVC
NUM    ID     LIST
----------------------------------------------------------------

================================================================
                            1483 IP
================================================================
PORT  VLAN      PVC        VLAN           LOCAL   REMOTE
NUM    ID     VPI.VCI   MAC ADDRESS       IP ADDRESS IP ADDRESS
----------------------------------------------------------------
3/8   7       0.100     00:e0:7b:7b:52:01 10.10.80.239 10.10.80.2
================================================================
                            1483 IPX
================================================================
PORT  VLAN      PVC        VLAN           IPX NETWORK  IPX
NUM    ID     VPI.VCI   MAC ADDRESS         NUMBER     ENCAP
----------------------------------------------------------------
Passport-8610:5#
```

Table 26 describes the information fields for the `show ports info atm 1483` command.

Table 26 Information fields for the show ports info atm 1483 command

Field	Description
PORT NUM	Port number.
VLAN ID	VLAN name to which the ELAN belongs.
PVC LIST	List of permanent virtual circuits.

Table 26 Information fields for the show ports info atm 1483 command (continued)

Field	Description
VLAN MAC ADDRESS	MAC address assigned to this VLAN: used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
LOCAL IP ADDRESS	Local IP address for connection type IP.
REMOTE IP ADDRESS	Remote IP address for connection type IP.
IPX NETWORK NUMBER	Network number.
IPX ENCAP	Encapsulation method: llc, snap, ether-ii, or raw.

show ports stats atmport command

This command displays statistics for atm ports (Figure 35). The command uses the syntax:

```
show ports stats atmport [<port num>]
```

Figure 35 show ports stats atmport [<port num>] command output

```
Passport-8606:6/show/ports/stats# atmport
================================================================================
                          ATM Port Statistics I
================================================================================
PORT      IN       OUT        IN CORR   IN UNCORR
NUM       CELLS    CELLS      HCS ERR    HCS ERR
--------------------------------------------------------------------------------
3/1       0        6744908     0          0
3/2       0        6744901     0          0
3/3       0        6744893     0          0
3/4       0        6744888     0          0
3/5       0        35314189    0          0
================================================================================
                                       ATM Port Statistics II
================================================================================
PORT   IN     OUT    IN DROP    OUT DROP  UNKNOWN VPI/VCI      IDLE
NUM    PKTS   PKTS    PKTS       PKTS        CELLS            CELLS
--------------------------------------------------------------------------------
3/1     0      0       0          0          0               6746913
3/2     0      0       0          0          0               6746912
3/3     0      0       0          0          0               6746913
3/4     0      0       0          0          0               8096349
3/5     0      0       0          0          0              42386582

Passport-8606:6/show/ports/stats#
```

Table 27 describes the information fields for the `show ports stats atmport` command.

Table 27 Information fields for the show ports stats atmport command

Field	Description
PORT NUM	Port number.
IN CELLS	Received cells.
OUT CELLS	Transmitted cells.
IN CORR HCS ERR	Number of received cells in which the HCS was corrected.
IN UNCORR HCS ERR	Number of received cells dropped because the HCS could not be corrected.
IN PKTS	Number of packets received.

Table 27 Information fields for the show ports stats atmport command (continued)

Field	Description
OUT PKTS	Number of packets transmitted.
IN DROP PKTS	Number of in-bound packets dropped.
OUT DROP PKTS	Number of out-bound packets dropped.
UNKNOWN VPI/VCI CELLS	Number of packets for which the vpi/vci values are unknown.
IDLE CELLS	Cells that are inactive.

show ports stats atm felinecurrent

This command displays current statistics on the far end line, which is at the receiving end. The command uses the syntax:

`show ports stats atm felinecurrent` [<*ports*>]

Figure 36 shows sample output for the `show ports stats atm felinecurrent` command.

Figure 36 show ports stats atm felinecurrent command output

```
Passport-8610:5/show/ports/stats/atm# felinecurrent
================================================================================
                      ATM Far End Line Current Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-L) SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 0
3/5       0                 0                 0                 0
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

Passport-8610:5/show/ports/stats/atm# felinecurrent
```

Table 28 describes the information fields for the `show ports stats atm felinecurrent` command.

Table 28 Information fields for the show ports stats atm felinecurrent command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS	Number of seconds that the interface is unavailable.

show ports stats atm felineinterval

This command displays statistics (Figure 37) on the far end line over a 15-minute interval. You specify which interval, or span of intervals, to display for the command. The command uses the syntax:

`show ports stats atm felineinterval <intervalid> [<ports>]`

Figure 37 show ports stats atm felineinterval command output

```
Passport-8610:5/show/ports/stats/atm# felineinterval 96
================================================================================
                     ATM Far End Line Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION UNAVAILABLE
NUM       COUNT (ES)        COUNT (SES)        COUNT (CV-L) SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 0
3/5       0                 0                 0                 0
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0
INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm#
```

Table 29 describes the information fields for the `show ports stats atm felineinterval` command.

Table 29 Information fields for the show ports stats atm felineinterval command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).

Table 29 Information fields for the show ports stats atm felineinterval command (continued)

Field	Description
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-L)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	The number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

show ports stats atm fepathcurrent

This command displays current statistics (Figure 38) for the far end path, which is at the receiving end. The command uses the syntax:

```
show ports stats atm fepathcurrent [<ports>]
```

Figure 38 show ports stats atm fepathcurrent command output

```
Passport-8610:5/show/ports/stats/atm# fepathcurrent
================================================================================
                      ATM Far End Path Current Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-P)      SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 264
3/5       0                 0                 0                 264
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

Passport-8610:5/show/ports/stats/atm# fepathcurrent
```

Table 30 describes the information fields for the `show ports stats atm fepathcurrent` command.

Table 30 Information fields for the show ports stats atm fepathcurrent command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	The number of seconds that the interface is unavailable.

show ports stats atm fepathinterval

This command displays statistics (Figure 39) on the far end path over a 15-minute interval. You specify the interval or span of intervals to display. The command uses the syntax:

`show ports stats atm fepathinterval <intervalid> [<ports>]`

Figure 39 show ports stats atm fepathinterval command output

```
Passport-8610:5/show/ports/stats/atm# fepathinterval 96

================================================================================
                    ATM Far End Path Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-P)      SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                 0                 900
3/5       0                 0                 0                 900
9/1       0                 0                 0                 0
9/2       0                 0                 0                 0
9/3       0                 0                 0                 0
9/4       0                 0                 0                 0
9/5       0                 0                 0                 0
9/6       0                 0                 0                 0
9/7       0                 0                 0                 0
9/8       0                 0                 0                 0

INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm# fepathinterval 96
```

Table 31 describes the information fields for the `show ports stats atm fepathinterval` command.

Table 31 Information fields for the show ports stats atm fepathinterval command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

show ports stats atm linecurrent

This command displays current statistics (Figure 40) for the line. The command uses the syntax:

```
show ports stats atm linecurrent [<ports>]
```

Figure 40 show ports stats atm linecurrent command output

```
Passport-8610:5/show/ports/stats/atm# linecurrent

================================================================================
                            ATM Line Current Stats
================================================================================
PORT  ERRORED SECONDS  SEVERELY ERRORED  CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)       COUNT (SES)       COUNT (CV-L)    SECONDS (UAS) STATUS
--------------------------------------------------------------------------------
3/1       0             0                 0             110       LineAIS
3/5       0             0                 0             110       Line AIS
9/1       0             0                 0             0         No Defect
9/2       0             0                 0             0         No Defect
9/3       0             0                 0             0         No Defect
9/4       0             0                 0             0         No Defect
9/5       0             0                 0             0         No Defect
9/6       0             0                 0             0         No Defect
9/7       0             0                 0             0         No Defect
9/8       0             0                 0             0         No Defect

Passport-8610:5/show/ports/stats/atm# linecurrent
```

Table 32 describes the information fields for the `show ports stats atm linecurrent` command.

Table 32 Information fields for the show ports stats atm linecurrent command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).

Table 32 Information fields for the show ports stats atm linecurrent command (continued)

Field	Description
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUS	Status of defects.

show ports stats atm lineinterval

This command displays statistics (Figure 41) for the line over a 15-minute interval. You can specify any interval or span of intervals. The command uses the syntax:

```
show ports stats atm lineinterval <intervalid> [<ports>]
```

Figure 41 show ports stats atm lineinterval command output

```
Passport-8610:5/show/ports# stats atm lineinterval 96
================================================================================
                          ATM Line Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION    UNAVAILABLE
NUM      COUNT (ES)      COUNT (SES)      COUNT (CV-L)    SECONDS (UAS)
--------------------------------------------------------------------------------
3/1       0                0                0                990
3/5       0                0                0                990
9/1       0                0                0                0
9/2       0                0                0                0
9/3       0                0                0                0
9/4       0                0                0                0
9/5       0                0                0                0
9/6       0                0                0                0
9/7       0                0                0                0
9/8       0                0                0                0

INTERVAL ID = 96
Passport-8610:5/show/ports#
```

Table 33 describes the information fields for the `show ports stats atm lineinterval` command.

Table 33 Information fields for The show ports stats atm lineinterval command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.

show ports stats atm pathcurrent

This command displays current statistics (Figure 42) on the path, on the transmitting end. The command uses the syntax:

`show ports stats atm pathcurrent [<ports>]`

Figure 42 show ports stats atm pathcurrent command output

```
Passport-8610:5/show/ports/stats/atm# pathcurrent

================================================================================
                          ATM Path Current Stats
================================================================================
PORT  ERRED SECS  SEVERELY ERRED CODE VIOLATION  UNAVAILABLE
NUM   COUNT (ES)  COUNT (SES)    COUNT (CV-P)    SECONDS (UAS)  STATUS WIDTH
--------------------------------------------------------------------------------
3/1       0         0                0         160       Path AIS  3
3/5       0         0                0         160       Path AIS  3
9/1       0         0                0         0         No Defect 2
9/2       0         0                0         0         No Defect 2
9/3       0         0                0         0         No Defect 2
9/4       0         0                0         0         No Defect 2
9/5       0         0                0         0         No Defect 2
9/6       0         0                0         0         No Defect 2
9/7       0         0                0         0         No Defect 2
9/8       0         0                0         0         No Defect 2
Passport-8610:5/show/ports/stats/atm#
```

Table 34 describes the information fields for the `show ports stats atm pathcurrent` command.

Table 34 Information fields for the show ports stats atm pathcurrent command

Field	Description
PORT NUM	Port number.
ERRED SECS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
STATUSWIDTH	Status and number of defects.

show ports stats atm pathinterval

This command displays statistics (Figure 43) on the path for a 15-minute interval. You specify the interval or span of intervals to display. The command uses the syntax:

`show ports stats atm pathinterval <intervalid> [<ports>]`

Figure 43 show ports stats atm pathinterval command output

```
Passport-8610:5/show/ports/stats/atm# pathinterval 96

================================================================================
                           ATM Path Interval Stats
================================================================================
PORT     ERRORED SECONDS    SEVERELY ERRORED    CODE VIOLATION     UNAVAILABLE
NUM      COUNT (ES)         COUNT (SES)         COUNT (CV-P)       SECONDS(UAS)
--------------------------------------------------------------------------------
3/1       0                 0                   0                  160
3/5       0                 0                   0                  160
9/1       0                 0                   0                  0
9/2       0                 0                   0                  0
9/3       0                 0                   0                  0
9/4       0                 0                   0                  0
9/5       0                 0                   0                  0
9/6       0                 0                   0                  0
9/7       0                 0                   0                  0
9/8       0                 0                   0                  0

INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm#
```

Table 35 describes the information fields for the `show ports stats atm pathinterval` command.

Table 35 Information fields for the show ports stats atm pathinterval command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).

Table 35 Information fields for the show ports stats atm pathinterval command (continued)

Field	Description
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-P)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
UNAVAILABLE SECONDS (UAS)	Number of seconds that the interface is unavailable.
INTERVAL ID	Specified interval.

show ports stats atm sectioncurrent

This command displays the current statistics (Figure 44) on the section. The command uses the syntax:

`show ports stats atm sectioncurrent` [<*ports*>]

Figure 44 show ports stats atm sectioncurrent command output

```
Passport-8610:5/show/ports/stats/atm# sectioncurrent

================================================================================
                         ATM Section Current Stats
================================================================================
PORT  ERRORED SECONDS SEVERELY ERRORED CODE VIOLATION  SEVERELY ERRORED
NUM   COUNT (ES)      COUNT (SES)      COUNT (CV-S)    FRAMES (SEF) STATUS
--------------------------------------------------------------------------------
3/1    796            796              0              796          LOS
3/5    796            796              0              796          LOS
9/1    0              0                0              0            No Defect
9/2    0              0                0              0            No Defect
9/3    0              0                0              0            No Defect
9/4    0              0                0              0            No Defect
9/5    0              0                0              0            No Defect
9/6    0              0                0              0            No Defect
9/7    0              0                0              0            No Defect
Passport-8610:5/show/ports/stats/atm# sectioncurrent
```

Table 36 describes the information fields for the `show ports stats atm sectioncurrent` command.

Table 36 Information fields for the show ports stats atm sectioncurrent command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-S)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
SEVERELY ERRORED FRAMES (SEF)	Number of seconds that the interface is unavailable.
STATUS	Indicates status of defects.

show ports stats atm sectioninterval

This command displays statistics (Figure 45) on the section over a 15-minute interval. You specify the interval or span of intervals to display. The command uses the syntax:

`show ports stats atm sectioninterval <intervalid> [<ports>]`

Figure 45 show ports stats atm sectioninterval command output

```
Passport-8610:5/show/ports/stats/atm# sectioninterval 96
================================================================================
                          ATM Section Interval Stats
================================================================================
PORT     ERRORED SECONDS   SEVERELY ERRORED   CODE VIOLATION SEVERELY ERRORED
NUM      COUNT (ES)        COUNT (SES)        COUNT (CV-S) FRAMES (SEF)
--------------------------------------------------------------------------------
3/1      900               900                0                   900
3/5      900               900                0                   900
9/1      0                 0                  0                   0
9/2      0                 0                  0                   0
9/3      0                 0                  0                   0
9/4      0                 0                  0                   0
9/5      0                 0                  0                   0
9/6      0                 0                  0                   0
9/7      0                 0                  0                   0
9/8      0                 0                  0                   0
INTERVAL ID = 96
Passport-8610:5/show/ports/stats/atm# sectioninterval 96
```

Table 37 describes the information fields for the `show ports stats atm sectioninterval` command.

Table 37 Information fields for the show ports stats atm sectioninterval command

Field	Description
PORT NUM	Port number.
ERRORED SECONDS COUNT (ES)	Errored Second (ES) is a second with one or more Coding Violations (CV) or one or more incoming defects (for example, SEF, LOS, AIS, LOP).
SEVERELY ERRORED COUNT (SES)	Severely Errored Second (SES) is a second with x or more CVs, or one or more incoming defects.
CODE VIOLATION COUNT (CV-S)	Coding Violations (CV) are Bit Interleaved Parity (BIP) errors that are detected in the incoming signal. CV counters are incremented for each BIP error detected.
SEVERELY ERRORED FRAMES (SEF)	Severely Errored Framing Second (SEFs) is a second containing one or more SEF events.
INTERVAL ID	Specified interval.

show ports stats atm sonetmediumtbl

This command displays statistics (Figure 46) on the SONET medium. The command uses the syntax:

```
show ports stats atm sonetmediumtbl [<ports>]
```

Figure 46 show ports stats atm sonetmediumtbl command output

```
Passport-8610:5/show/ports/stats/atm# sonetmediumtbl
  ================================================================================
                              ATM SONET Medium Table
================================================================================
PORT      MEDIUM     TIME       VALID          LINE   LINE       CIRCUIT
NUM       TYPE       ELAPSED    INTERVALS      CODING TYPE       ID
--------------------------------------------------------------------------------
3/1            0          731        96          4          3          53754784
3/5            0          731        96          4          3          53754784
9/1            0          715        96          4          4          53754784
9/2            0          715        96          4          4          53754784
9/3            0          715        96          4          4          53754784
9/4            0          715        96          4          4          53754784
9/5            0          715        96          4          4          53754784
9/6            0          715        96          4          4          53754784
9/7            0          715        96          4          4          53754784
9/8            0          715        96          4          4          53754784

Passport-8610:5/show/ports/stats/atm# sonetmediumtbl
```

Table 38 describes the information fields for the show ports stats atm sonetmediumtbl command.

Table 38 Information fields for output of the show ports stats atm sonetmediumtbl command

Field	Description
PORT NUM	Port number.
MEDIUM TYPE	Identifies whether a sonet or sdh signal is used across the interface.

Table 38 Information fields for output of the show ports stats atm sonetmediumtbl command (continued)

Field	Description
TIME ELAPSED	Number of seconds, including partial seconds, that have elapsed since the beginning of the current measurement period. If the current interval exceeds the maximum value, the agent will return the maximum value.
VALID INTERVALS	Number of previous 15-minute intervals for which data was collected.
LINE CODING	Line coding for this interface. The B3ZS and CMI are used for electrical SONET/SDH signals (STS-1 and STS-3). The Non-Return to Zero (NZR) and the Return to Zero are used for optical SONET/SDH signals.
LINE TYPE	Line type for this interface. The line types are Single Mode fiber or Multi-Mode fiber interfaces.
CIRCUIT ID	Transmission vendor's circuit identifier, to facilitate troubleshooting.

Configuring ATM F5-OAM End-to-End Loopback

A Passport 8672ATME Module, by default, replies to ATM F5-OAM Loopback requests received. However, the transmission of F5-OAM Loopback requests and the processing of F5-OAM Loopback replies received require enabling this feature on a PVC by PVC basis. It is recommended that you enable ATM F5-OAM on all the PVCs configured on the PP8672 ATM port in order for upper layer protocols such as MLT and OSPF to be immediately aware of the port down status or link failures.

You can enable and define the parameters of the ATM F5-OAM Loopback feature and display statistics with Device Manager or the CLI. For information on how to configure this feature with the Device Manager, see Chapter 4, "Managing the Passport 8672ATME Module with Device Manager," on page 47.

The F5-OAM loopback feature uses the following CLI commands:

- `config atm pvc f5-oam command`
- `show ports info atm pvc [slot/port]`
- `show ports info atm f5-oam [slot/port]`
- `clear atm f5-oam [slot/port]`

config atm pvc f5-oam command

This CLI command enables/disables and configures the F5-OAM Loopback feature for a virtual circuit (VC). When this command is used for disabling the F5-OAM Loopback on a VC, the configuration parameters are ignored. The command uses the syntax:

```
config atm <slot/port> pvc f5-oam <vpi.vci> <enable|disable>
[send <value>] [retry <value>] [up <value>] [down <value>]
[trap <enable|disable>]
```

When this command is used for enabling the F5-OAM Loopback on a VC, the other parameters configure the F5-OAM Loopback. When the F5-OAM Loopback on a VC is already enabled, an enable command towards this VC may change its F5-OAM Loopback configuration but it does not alter its F5-OAM statistics. When the F5-OAM Loopback on a VC is disabled, an enable command towards this VC enables and configures its F5-OAM Loopback, and clears its F5-OAM Loopback statistics.

Table 39 describes the F5-OAM Loopback parameters.

Table 39 F5-OAM Loopback parameters

Configuration	Default	Values	Description
<enable|disable>	disabled	Enable/Disable	Enables/disables the F5-OAM Loopback feature.
send <value>	5 seconds	1..255	Sets the transmission rate (in seconds) of F5-OAM Loopback requests. This field is also referred as “send-frequency”.
retry <value>	1 second	1..255	Sets the retry-transmission rate (in seconds) of F5-OAM Loopback requests. This field is also referred as “retry-frequency”.
up <value>	3 responses	1..255	Set the number of consecutive F5-OAM Loopback replies that must be received to change the Loopback State to “up.” This configuration is also referred as “up-count”.

Table 39 F5-OAM Loopback parameters (continued)

Configuration	Default	Values	Description
down <value>	5 responses	1..255	Sets the number of consecutive F5-OAM Loopback replies that must fail to change the Loopback State to “down.” This configuration is also referred as “down-count”.
trap <value>	disabled	Enable/Disable	Enables/disables the transmission of an SNMP Trap when the F5-OAM Loopback changes from the DOWN VERIFY to DOWN state or from the UP VERIFY to UP state.

For example, to *enable* F5-OAM Loopback for VPI=0 & VCI=33 in port 6 of an ATM card in slot 3, and configure it with trap enabled, a retry-frequency of 2 seconds and up-count of 5 times, you would enter the following command:

Passport-8610:5# `config atm 3/6 pvc f5 0.33 enable trap enable retry 2 up 5`

To *disable* the F5-OAM Loopback for VPI=0 & VCI=33 in port 6 of an ATM card in slot 3:

Passport-8610:5# `config atm 3/6 pvc f5 0.33 disable`

show ports info atm pvc [slot/port]

The `show ports info atm pvc [slot/port]` command displays the F5-OAM Loopback configuration among other PVC configurations.

Figure 47 displays sample output for the `show ports info atm pvc [slot/port]` command.

Figure 47 Sample output for the `show ports info atm pvc [slot/port]` command

```
================================================================================
                                    ATM PVC
================================================================================
PORT    PVC            SERVICE   F5     OAM    SEND   RETRY    UP     DOWN
NUM   VPI.VCI   ENCAPS   TYPE    OAM    TRAP   FREQ    FREQ   COUNT  COUNT
--------------------------------------------------------------------------------
3/1   0.100     llc-snap  UBR  disable  disable  5      1      3      5
3/5   0.100     llc-snap  UBR  enable   disable  5      1      3      5
3/5   0.105     llc-snap  UBR  disable  disable  5      1      3      5
3/5   0.111     llc-snap  UBR  enable   disable  10     3      3      5
3/6   0.33      llc-snap  UBR  enable   enable   5      2      5      5
3/7   0.101     llc-snap  UBR  disable  disable  5      1      3      5
3/8   0.100     llc-snap  UBR  disable  disable  5      1      3      5
```

As shown in Figure 47, only three PVCs have its F5-OAM Loopback enabled. Furthermore, only one PVC (3/5 0.100) is using the default F5-OAM Loopback configuration.

show ports info atm f5-oam [slot/port]

The `show ports info atm f5-oam [slot/port]` command displays the F5-OAM Loopback status and statistics for a particular PVC.

Figure 48 displays a sample output of the of the `show ports info atm f5-oam [slot/port]` command.

Figure 48 Sample output of the `show ports info atm f5-oam [slot/port]` command

```
Passport-8610:5# show port info atm f5-oam

================================================================================
                                ATM PVC F5 Status & Statistics
================================================================================
PORT    PVC        F5 VC      LOOPBACK    LOOPBACK    LOOPBACK
NUM   VPI.VCI      STATUS     REQ SENT    REPLY RCV   REPLY SENT
--------------------------------------------------------------------------------
3/1   0.100     not managed
3/5   0.100        down        15791        0           0
3/5   0.105     not managed
3/5   0.111        down        0            0           0
3/6   0.33          up         15800        15717       0
3/7   0.101     not managed
3/8   0.100     not managed
```

Table 40 defines the status and statistics in the `show ports info atm f5-oam [slot/port]` command.

Table 40 Status and statistic definition

F5 VC Status	Definition
NOT MANAGED	The VC is not being managed by OAM. (The VC is not transmitting F5-OAM Loopback Requests as F5-OAM Loopback is disabled.)
DOWN VERIFY	An OAM loopback failed. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify that the VC is down. After down-count unsuccessful retries, the VC goes to the down state (see LbDownCount in Table 13 on page 71).
DOWN	The VC has not received responses to end-to-end F5-OAM loopback cells.
UP VERIFY	An OAM loopback was successful. End-to-end F5-OAM loopback cells are sent at the specified retry frequency to verify the VC is really up. After up-count successive and successful loopback retries, the VC goes to the Up state (see LbUpCount in Table 13 on page 71).
UP	End-to-end loopbacks are successful.
Loopback Req Sent	Number of F5-OAM Loopback requests transmitted for a particular PVC.
Loopback Reply Rcv	Number of F5-OAM Loopback replies received for a particular PVC.
Loopback Reply Sent	Number of F5-OAM Loopback replies transmitted in response to a F5-OAM Loopback Request Received for a particular PVC. Although this functionality occurs while the F5-OAM Loopback is disabled, this statistic only starts when the F5-OAM Loopback is enabled.

clear atm f5-oam [slot/port]

This command clears the F5-OAM statistics for all the F5-OAM loopbacks that are currently enabled under the ATM port and slot.

To clear all the F5-OAM statistics for a particular ATM port and slot, enter this command:

```
Passport-8610:5# clear atm f5-oam 2/3
```

Displaying packet loss counters

The CLI command `sh ports stats interface main` displays packet loss counters. Table 41 displays a sample output of this command.

Table 41 Sample output for the `sh ports stats interface main` command

Passport 8600 #5: `sh ports stats interface main`

```
================================================================================
                              Port Stats Interface
================================================================================

 PORT     IN       OUT      IN      OUT       IN          OUT         OUTLOSS
  NUM   OCTETS   OCTETS   PACKET  PACKET  FLOWCTRL   FLOWCONTROL     PACKETS
8/1        0        0        0       0         0             0           0
8/5        0        0        0       0         0             0           0
10/1       0        0        0       0         0             0           0
10/2       0        0        0       0         0             0           0
10/3       0        0        0       0         0             0           0
10/4       0        0        0       0         0             0           0
10/5       0        0        0       0         0             0           0
10/6       0        0        0       0         0             0           0
10/7       0        0        0       0         0             0           0
10/8       0        0        0       0         0             0           0
10/9       0        0        0       0         0             0           0
Passport 8600 #5:
```

Chapter 6
Configuring the Passport 8672ATME Module

This chapter contains the following topics:

- "Initial configuration," next
- "Basic configuration procedures" on page 120

For detailed information on Device Manager, and the CLI, refer to:

- *Getting Started with the Passport 8000 Series Switch Management Software*
- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using Device Manager Release 5.x.x*
- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using the Command Line Interface Release 3.2*

One switch fabric module (either the Passport 8690SF or Passport 8691SF) acts as the CPU for the chassis, and the other module is the standby CPU, taking over in case of failure. Note that the administrative and operational configurations of the Passport 8672ATME Module are *not* retained after failover. When a CPU failover occurs, all traffic on the chassis stops momentarily while the standby CPU re-initializes all input/output modules.

Initial configuration

This section provides information on the initial configuration procedures for the Passport 8672ATME Module.

Before you can pass traffic using the Passport 8672ATME Module with its installed MDA, you must change the clock setting. You can do this in one of two ways:

- "Changing the clock setting using Device Manager," next
- "Changing the clock setting using the CLI" on page 119

Note: The Passport 8672ATME Module supports only Ethernet ELANs.

Changing the clock setting using Device Manager

This section provides instructions on changing the clock setting.

Note: If you are connecting one Passport 8672ATME Module directly to another Passport 8672ATME Module without going through the SONET cloud, the clock mode at both ends of the circuit may be free-running, but only one end of this circuit may be configured as loop-timed.

To change the clock setting using Device Manager:

1. Highlight the port.
2. Choose Edit > Port.

   The Port dialog box opens with the Interface tab displayed (Figure 12 on page 52).
3. Click the ATM tab.

   The ATM tab opens. (Figure 49).

Figure 49 ATM tab

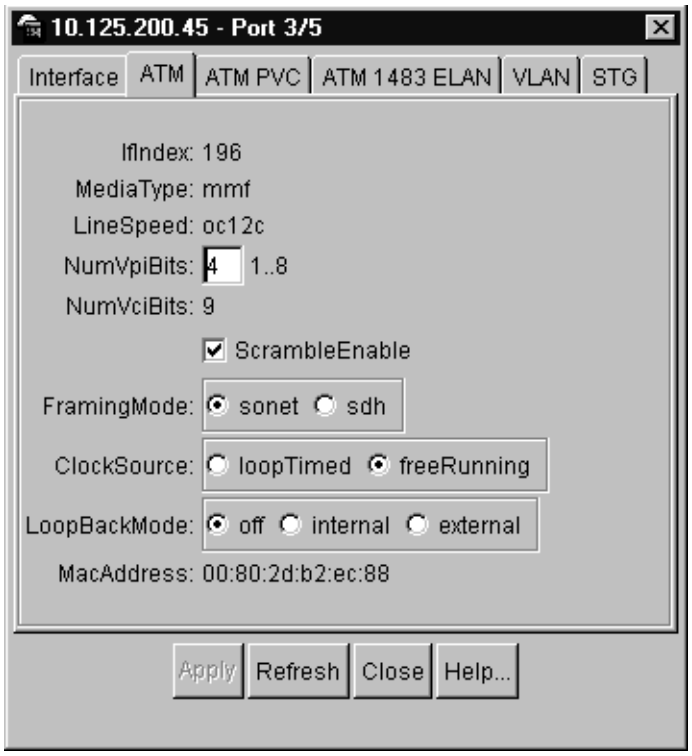


Table 8 on page 59 describes the ATM tab fields.

4 To set the clock setting, in the ClockSource section, click loopTimed or freeRunning.

5 Click Apply.

Changing the clock setting using the CLI

To change the clock setting using the CLI, enter:

```
config atm <ports> clock-source <loop-timed|free-running>
```

See "config atm command" on page 80.

Basic configuration procedures

This section provides instructions on configuring the Passport 8672ATME Module with Device Manager to perform basic networking tasks:

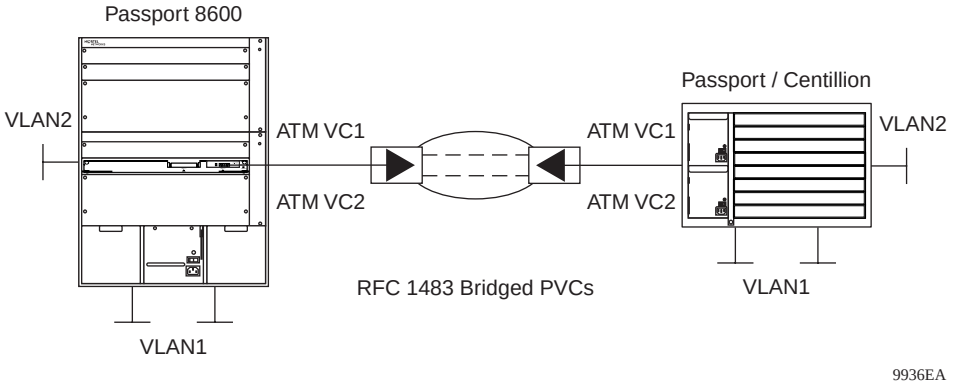
- "Bridging point-to-point traffic using an ATM 1483 PVC using Device Manager," next
- "Bridging point-to-point traffic using an ATM 1483 PVC using the CLI" on page 127
- "Bridging point-to-multipoint traffic using an ATM 1483 PVC using Device Manager" on page 127
- "Bridging point-to-multipoint traffic using an ATM 1483 PVC using the CLI" on page 129
- "Configuring an IP routing 1483 PVC using Device Manager" on page 129
- "Configuring an IP routing 1483 PVC using the CLI" on page 136
- "Configuring an IPX routing 1483 PVC using Device Manager" on page 137
- "Configuring an IPX routing 1483 PVC using the CLI" on page 143

Bridging point-to-point traffic using an ATM 1483 PVC using Device Manager

In this configuration (Figure 50), the Passport 8672ATME Module has an ATM 1483 PVC bridged across an ATM PVC network. Use a separate ATM1483 PVC for each VLAN. The VLANs may appear on the same port or on different ports of the Passport 8672ATME Modules. You cannot bridge between PVCs in the same VLAN on the same port of the Passport 8672ATME Module.

Nortel Networks recommends that you create a new STP group for bridging between ATM ports and Ethernet ports. You should remove the ATM port from the default STP group and from the default VLAN. This minimizes BPDU traffic to the ATM port. Passport ports receive BPDU traffic for the default STP group and the tagged VLAN.

Figure 50 Point-to-point bridging using 1483 PVCs



To complete this configuration, use the following procedures:

- "Creating a VLAN "byPort" and adding ports," next
- "Configuring two ATM 1483 PVCs on the same ATM port" on page 128
- "Associating the PVC with the VLAN" on page 126

Use Device Manager and or CLI to perform these configuration and related tasks on the Passport 8672ATME Module.

Creating a VLAN "byPort" and adding ports

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 51).

Figure 51 Basic tab

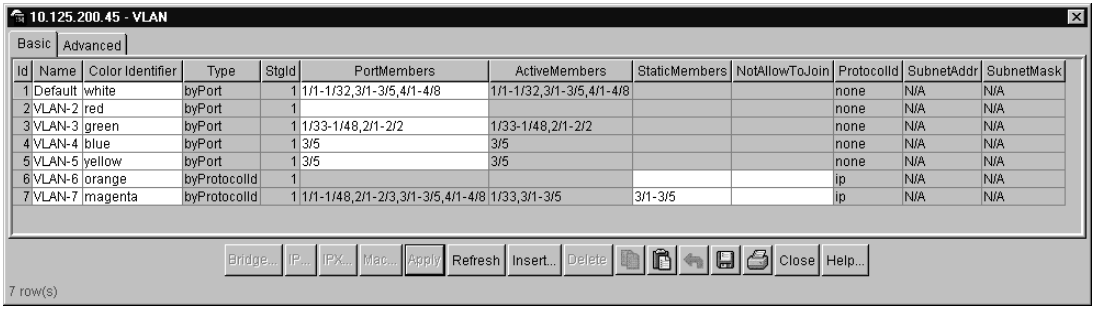

10.125.200.45 - VLAN
Basic
Advanced
Id | Name | Color Identifier | Type | StgId | PortMembers | ActiveMembers | StaticMembers | NotAllowToJoin | ProtocolId | SubnetAddr | SubnetMask
1 | Default | white | byPort | 1 | 1/1-1/32,3/1-3/5,4/1-4/8 | 1/1-1/32,3/1-3/5,4/1-4/8 | | | none | N/A | N/A
2 | VLAN-2 | red | byPort | 1 | | | | | none | N/A | N/A
3 | VLAN-3 | green | byPort | 1 | 1/33-1/48,2/1-2/2 | 1/33-1/48,2/1-2/2 | | | none | N/A | N/A
4 | VLAN-4 | blue | byPort | 1 | 3/5 | 3/5 | | | none | N/A | N/A
5 | VLAN-5 | yellow | byPort | 1 | 3/5 | 3/5 | | | none | N/A | N/A
6 | VLAN-6 | orange | byProtocolId | 1 | | | | | ip | N/A | N/A
7 | VLAN-7 | magenta | byProtocolId | 1 | 1/1-1/48,2/1-2/3,3/1-3/5,4/1-4/8 | 1/33,3/1-3/5 | 3/1-3/5 | | ip | N/A | N/A
Bridge... IP... IPX... Mac... Apply Refresh Insert... Delete Close Help...
7 row(s)

Table 42 describes the Basic tab fields.

Table 42 Basic tab fields

Field	Description
Id	Unique VLAN identifier.
Name	An administratively-assigned name for this VLAN.
ColorIdentifier	An administratively-assigned color code for this VLAN. The value of this object is used by the VLAN Manager GUI tool to select a color when it draws this VLAN on the screen.
Type	Type of VLAN, distinguished according to the policy used to define its port membership.
StgId	Spanning Tree Group (STG) used by the VLAN to determine the state of its ports. If the VLAN is not associated with any STG, this value should be set to zero.
PortMembers	Set of ports that are members (static or dynamic) of this VLAN.
ActiveMembers	Set of ports that are currently active in this VLAN. Active ports include all static ports and any dynamic ports where the VLAN policy was met.
StaticMembers	Set of ports that are static members of this VLAN. A static member of a VLAN is always active and is never aged out.
NotAllowtoJoin	Set of ports that are not allowed to become members of this VLAN.
ProtocolId	Protocol identifier of this VLAN. This value is meaningful only if rcVlanType is equal to byProtocolId(3).
SubnetAddr	IP subnet address of this VLAN. This value is meaningful only if rcVlanType is equal to byIpSubnet(2). For other VLAN types it should have the value 0.0.0.0.
SubnetMask	IP subnet mask of this VLAN. This value is meaningful only if rcVlanType is equal to byIpSubnet(2). For other VLAN types it should have the value 0.0.0.0.

2 Click Insert.

The VLAN, Insert Basic dialog box opens (Figure 52).

Figure 52 VLAN, Insert Basic dialog box

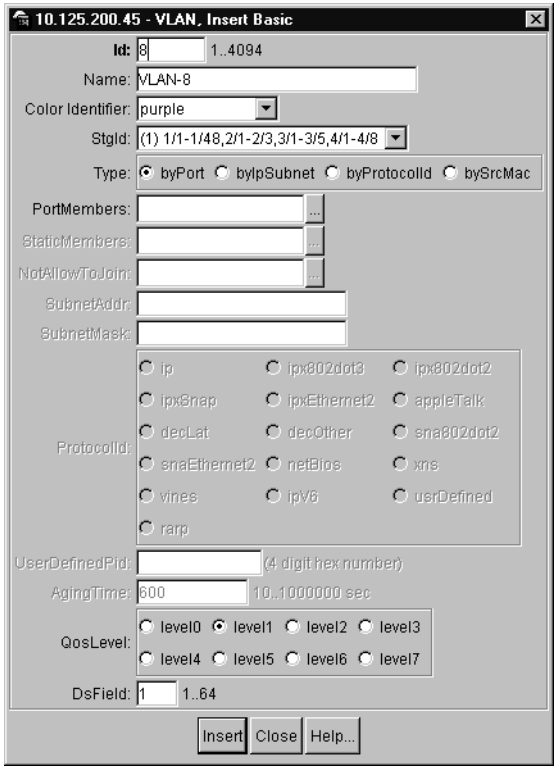


Table 43 describes the VLAN, Insert Basic dialog box fields.

Table 43 VLAN, Insert Basic dialog box fields

Field	Description
Id	Unique VLAN identifier.
Name	An administratively-assigned name for this VLAN.
ColorIdentifier	An administratively-assigned color code for this VLAN. The value of this object is used by the VLAN Manager GUI tool to select a color when it draws this VLAN on the screen.
StgId	Spanning Tree Group (STG) used by the VLAN to determine the state of its ports. If the VLAN is not associated with any STG, this value should be set to zero.
Type	Type of VLAN, distinguished according to the policy used to define its port membership.

Table 43 VLAN, Insert Basic dialog box fields (continued)

Field	Description
PortMembers	Set of ports that are members (static or dynamic) of this VLAN.
QoSLevel	Quality of Service level.

3 Do the following:

a In the Id field, enter the Id number for the VLAN (an integer between 0 and 4094).

b In the Name field, enter the VLAN name.

c In the Color Identifier field, select a color from the list.

d In the StgIdField, select the STG for the port.

e In the Type field, chick byPort.

f In the PortMembers field, click the button to view ports.

The VlanPortMembers dialog box opens (Figure 53).

Figure 53 VlanPortMembers dialog box

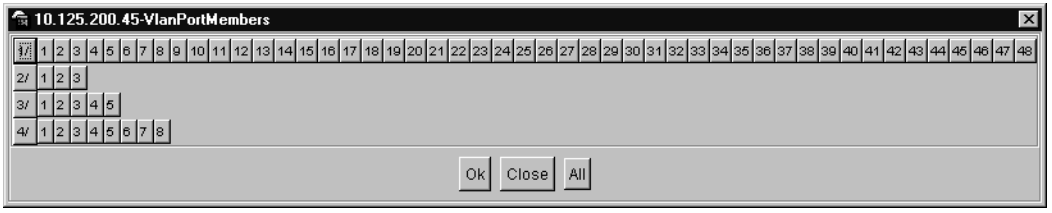


Table 44 describes the VlanPortMembers dialog box fields.

Table 44 VlanPortMembers dialog box fields

Field	Description
Left column	Card number.
All other numbers	Port numbers.

4 Click port numbers to add ports to the VLAN.

5 Click OK.

The VlanPortMembers dialog box closes and the VLAN, Insert Basic dialog is redisplayed.

6 Click Close.

Configuring an ATM 1483 PVC

To configure an ATM 1483 PVC:

1 From the Device Manager menu bar, choose Edit > ATM.

The port dialog box opens with the ATM tab displayed (Figure 25).

Table 8 on page 59 describes the ATM tab fields.

2 Click the ATM PVC tab.

The ATM PVC tab opens (Figure 17 on page 61).

Table 9 on page 61 describes the ATM PVC tab fields.

3 Click Insert.

The ATM, Insert ATM dialog box opens (Figure 18 on page 62).

Table 10 on page 62 describes the ATM, Insert ATM tab fields.

4 Do the following:

a In the Port field, click the button to view ports.

b Select the port.

c In the Vpi field, type the VPI value based on the VPI bit set in the ATM port tag (i.e., if Vpi bit is 4, the VPI range is 0..15).

d In the Vci field, type the VCI value based on the VPI bit set in the ATM port configuration (see Table 10 on page 62 for Device Manager information or Table on page 81 for CLI information).

e In the Name field, type the name of the ATM PVC card.

f In the Encapsulation field, select the encapsulation method (null or IIcSnap).

g In the Service type field, select the service type (ubr or vbr).

h If you select vbr in the Service type field, complete these fields:

In the PeakCellRate field, enter the PCR (an integer between 86 and 733490).

In the SustainedCellRate field, enter the SCR (an integer between 86 and 733490).

In the MaxBurstSize field, type the maximum burst size (an integer between 2 and 255).

5 Click Insert.

The ATM, Insert ATM dialog box closes, and the ATM PVC tab is redisplayed.

6 Click Close.

Associating the PVC with the VLAN

1 From the Device Manager menu bar, choose Edit > ATM.

The Port dialog box opens with the ATM tab displayed (Figure 16 on page 59).

Table 8 on page 59 describes the ATM tab items.

2 Click the ATM 1483 ELAN tab.

The ATM 1483 ELAN tab opens.

3 Click Insert.

The Insert ATM 1483 ELAN dialog box opens (Figure 21 on page 66).

Table 12 on page 66 describes the Insert ATM 1483 ELAN dialog box fields.

4 Do the following:

a In the Port field, click the button to view ports.

b Select the port for which you configured the ATM PVC in "Configuring two ATM 1483 PVCs on the same ATM port" on page 128.

c In the VlanId field, enter the VLAN Id you created in "Creating a VLAN "byPort" and adding ports" on page 121.

d In the PvcIds field, enter the value for the PVC IDs you created in "Configuring two ATM 1483 PVCs on the same ATM port" on page 128.

e In the ConnectType field, select bridged.

5 Click Insert.

The Insert ATM 1483 ELAN dialog box closes, and the ATM 1483 ELAN tab is redisplayed.

6 Click Close.

Bridging point-to-point traffic using an ATM 1483 PVC using the CLI

To configure the Passport 8672ATME Module for ATM 1483 PVCs for VLANs bridged across an ATM PVC network, using the CLI:

1 To create a VLAN by port, enter:

```
config vlan 2 create byport 1
```

2 To add an ATM port (in this example, 1/1) and several Ethernet ports (in this example, 3/40 to 3/48) to the VLAN, enter:

```
config vlan 2 port add 1/1, 3/40-3/48
```

3 To configure an ATM 1483 PVC for null-encapsulation and ubr, enter:

```
config atm 1/1 pvc create 0.100 enc 1483-null serv
ubr
```

Alternatively, to configure an ATM 1483 PVC for null-encapsulation and vbr, enter:

```
config atm 1/1 pvc create 0.100 enc 1483-null serv
vbr<PCR value>scr<SCR value> mbs<MBS value>
```

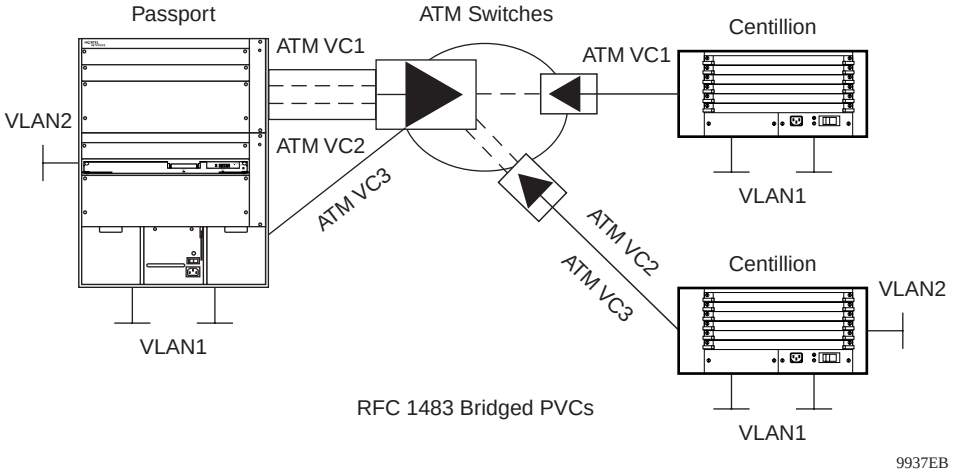
4 To associate the ATM 1483 bridged PVC with a VLAN, enter:

```
config atm 1/1 pvc 1483 bridged create 2 0.100,
0.101
```

Bridging point-to-multipoint traffic using an ATM 1483 PVC using Device Manager

In the configuration shown in Figure 54, the Passport 8672ATME Module is configured as a bridging hub to spokes through the WAN. Bridging is not allowed between PVCs in the same ELAN. For point-to-multipoint bridging, the end stations connected by each PVC circuit cannot communicate with one another.

Figure 54 Point-to-multipoint bridging using ATM 1483 PVCs



This configuration requires the following procedures:

- "Configuring two ATM 1483 PVCs on the same ATM port," next
- "Associating the PVCs with the same VLAN" on page 128

Use Device Manager or the CLI to perform these configuration and related tasks on the Passport 8672ATME Module.

Configuring two ATM 1483 PVCs on the same ATM port

Follow the procedures outlined in "Bridging point-to-point traffic using an ATM 1483 PVC using Device Manager" on page 120 to configure two ATM PVCs on the same ATM port.

Associating the PVCs with the same VLAN

Follow the procedures outlined in "Associating the PVC with the VLAN" on page 126 to associate both PVCs with the same VLAN.

The Passport 8672ATME Module directs the two ATM 1483 bridged PVCs to two different ATM ports on the other end.

Bridging point-to-multipoint traffic using an ATM 1483 PVC using the CLI

To configure two ATM 1483 bridged PVCs using the CLI:

1. To create two VLANs by port, enter:

   ```
   config vlan 2 create byport 1
   ```

2. To add ATM port (1/1) and some Ethernet ports (3/40-3/48) into the VLAN, enter:

   ```
   config vlan 2 port add 1/1, 3/40-3/48
   ```

3. To create a 1483 Null-encapsulation UBR PVC, enter

   ```
   config atm 1/1 pvc create 0.100 ecn 1483-null serv
   ubr
   ```

   Or create a 1483 Null-encapsulation VBR PVC.

   ```
   config atm 1/1 pvc create 0.100 enc 1483-null serv
   vbr<PCR value>scr<SCR value> mbs<MBS value>
   ```

4. To associate the two 1483 bridged PVCs with the same VLAN, enter:

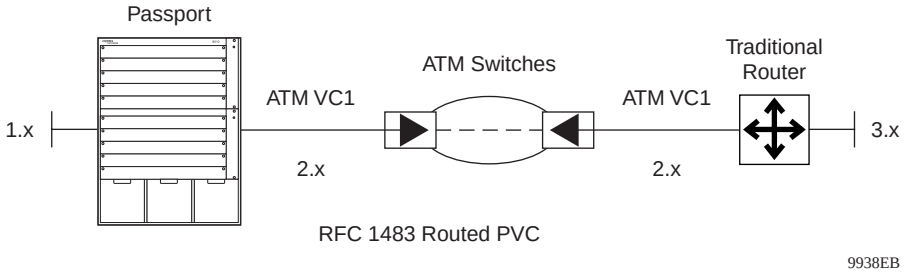
   ```
   config atm 1/1 pvc 1483 bridged create 2 0.100,
   0.101
   ```

The Passport 8672ATME Module directs the two ATM 1483 bridged PVCs to two different ATM ports on the other end.

Configuring an IP routing 1483 PVC using Device Manager

In the configuration shown in Figure 55, the Passport 8672ATME Module has an ATM 1483 PVC as the sole member of a VLAN configured for IP routing.

Figure 55 IP routing with ATM 1483 PVCs



Note: Each configured ATM 1483 PVC uses one VLAN. The Passport 8672ATME Module can be configured for a maximum of 256 VLANs per MDA and a maximum of 512 VLANs per card.

This configuration requires the following procedures:

- “Creating a VLAN “byPort” and adding ports” on page 121
- “Assigning IP addresses” on page 130
- “Enabling RIP routing” on page 132
- “Configuring a null-encapsulation PVC” on page 136
- “Associating the PVC with the VLAN” on page 136

Creating two VLANs “byPort”

To create two VLANs “byPort,” see “Creating a VLAN “byPort” and adding ports” on page 121. One VLAN must have only one ATM port. The second VLAN can have one or multiple Ethernet ports.

Assigning IP addresses

To assign an IP address to both VLANs:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 51 on page 121).

Table 42 on page 122 describes the fields in the VLAN Basic tab.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN dialog box opens with the IP Address tab displayed (Figure 56).

Figure 56 IP Address tab

Table 45 describes the IP Address tab fields.

Table 45 IP Address tab fields

Field	Description
Ip Address	IP address of the VLAN
Net Mask	Subnet mask associated with the IP address of the entry.
BcastAddrFormat	IP broadcast address format used on this interface.
ReasmMaxSize	Size of the largest IP datagram which this entity can re-assemble from incoming IP fragmented datagrams received on this interface.
VlanId	Unique VLAN identifier.
BrouterPort	Indicates whether this entry corresponds to a brouter port as opposed to a routable VLAN. This value cannot be changed after the row is created.

4 Click Insert.

The IP, VLAN, Insert IP Address dialog box opens (Figure 57).

Figure 57 IP, VLAN, Insert IP Address dialog box

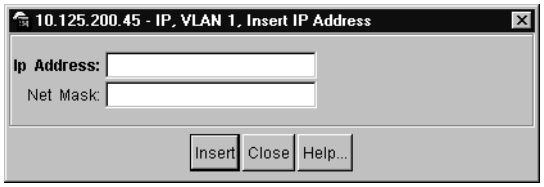


Table 46 describes the IP, VLAN, Insert IP Address dialog box fields.

Table 46 IP, VLAN, Insert IP Address dialog box fields

Field	Description
Ip Address	IP address of the VLAN
Net Mask	Subnet mask associated with the IP address of the entry.

5 In the IP Address field, type the IP address for the VLAN.

6 In the Net Mask field, type the net mask value.

Note: Use different subnets for each IP address.

7 Click Insert.

The IP, VLAN, Insert IP Address dialog box closes and the IP, VLAN dialog box is redisplayed.

8 Click Close.

Enabling RIP routing

Note: The Passport 8672ATME Module supports only RIP version 2.

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 51).

Table 42 on page 122 describes the VLAN Basic tab fields.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN dialog box opens with the IP Address tab displayed (Figure 56 on page 131).

Table 45 on page 131 describes the IP Address tab fields.

4 Click the RIP tab.

The RIP tab opens (Figure 58).

Figure 58 RIP tab

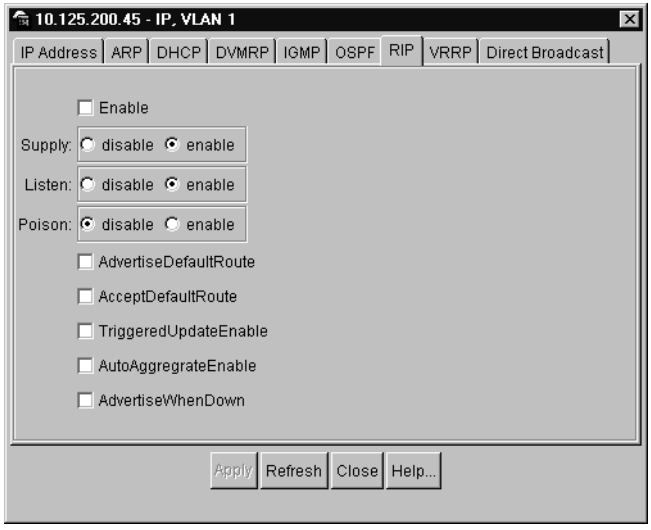


Table 47 describes the RIP tab fields.

Table 47 RIP tab fields

Field	Description
Enable	IP address of the VLAN.
Supply	Enables or disables RIP supply on the specified interface.
Listen	Enables or disables RIP reception on the specified interface.
Poison	Enables or disables operation of poison reverse on the specified interface. If poison is disabled, split-horizon operation is enabled.
AdvertiseDefaultRoute	Indicates whether this interface should advertise a RIP default route.
AcceptDefaultRoute	Indicates whether this interface should accept a RIP default route.
TriggeredUpdateEnable	Indicates whether the RIP triggered update feature should be enabled on this interface.

Table 47 RIP tab fields (continued)

Field	Description
AutoAggregateEnable	Indicates whether the auto aggregation feature should be enabled on this interface.
AdvertiseWhenDown	Indicates whether vlan state change should be notified to layer 3 or not, provided the vlan is configured as routable interface. Also used for single routable ports, in that case the criteria for state is PortOperStatus.

5 Click Enable.

6 Click Apply.

The IP Address tab is redisplayed.

7 Click Close.

Enabling OSPF routing

If the routing protocol is OSPF, to enable OSPF routing:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 51 on page 121).

Table 42 on page 122 describes the fields in the VLAN Basic tab.

2 Click one of the VLANs.

3 Click IP.

The IP, VLAN, Insert IP Address dialog box opens with the IP Address tab displayed (Figure 57 on page 131).

Table 45 on page 131 describes the Ip Address tab fields.

4 Click the OSPF tab.

The OSPF tab opens (Figure 59).

Figure 59 OSPF tab

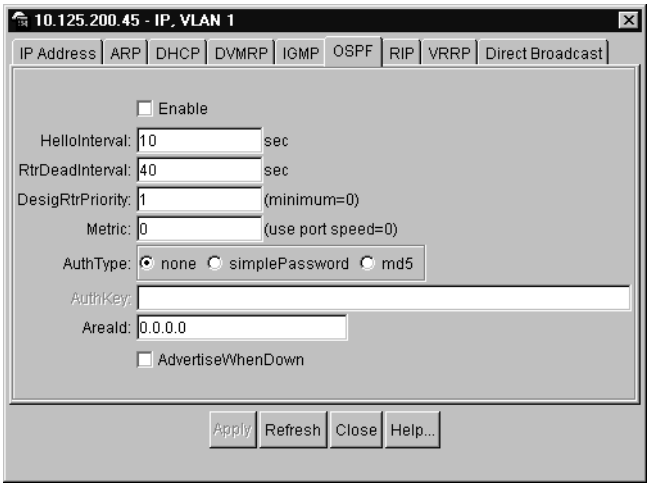


Table 48 describes the OSPF tab fields.

Table 48 OSPF tab fields

Field	Description
Enable	Enables or disables OSPF routing on the specified interface
HelloInterval	Length of time, in seconds, between the Hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network.
RtrDeadInterval	Number of seconds that a router's Hello packets have not been seen before its neighbors declare the router down.
DesigRtrPriority	Priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network.
Metric	Metric for this type of service (TOS) on this interface. The default value of the TOS 0 Metric is (10^9 / ifSpeed). The value FFFF means "no route via this TOS."
AuthType	Authentication type specified for an interface. Additional authentication types may be assigned locally.

Table 48 OSPF tab fields (continued)

Field	Description
AreaId	A 32-bit integer uniquely identifying the area to which the interface connects. Area ID 0.0.0.0 is used for the OSPF backbone.
AdvertiseWhenDown	Value used indicates whether or not a VLAN state change should be notified to layer 3, provided that the VLAN is configured as a routable interface. Also used for single routable ports. In that case, the criteria for state is PortOperStatus.

5 Click Enable.

6 Click Apply.

The OSPF tab closes, and the IP Address tab is redisplayed.

7 Click Close.

Configuring a null-encapsulation PVC

See "Configuring two ATM 1483 PVCs on the same ATM port" on page 128.

Associating the PVC with the VLAN

See "Associating the PVC with the VLAN" on page 126.

Follow the instructions there except, in the ConnectType field, select IP instead of bridged.

Configuring an IP routing 1483 PVC using the CLI

To configure the Passport 8672ATME Module for an ATM 1483 IP routed PVC, using the CLI:

1 To create two VLANs by port, enter:

```
config vlan 2 create byport 1
config vlan 3 create byport 1
```

2 To add an ATM port (in this example, 1/1) and several Ethernet ports (in this example, 3/40 to 3/48) to the VLAN, enter:

```
config vlan 2 port add 1/1
config vlan 3 port add 3/40-3/48
```

3 To configure IP addresses on both VLANs (use two different subnets), enter:

```
config vlan 2 ip <ip address>/<subnet mask>
config vlan 3 ip <ip address>/<subnet mask>
```

4 To enable routing on both VLANs, enter:

```
config vlan 2 ip rip enable
config vlan 3 ip rip enable
```

If necessary, use the following CLI commands to change RIP parameters:

```
config vlan 2 ip rip <sub-command>
config ip rip <sub-command>
```

5 To configure an ATM 1483 PVC with LLC/SNAP-encapsulation and UBR, enter:

```
config atm 1/1 pvc create 0.100 enc 1483-llc serv
ubr
```

6 To associate the 1483 IP routed PVC with a VLAN, enter:

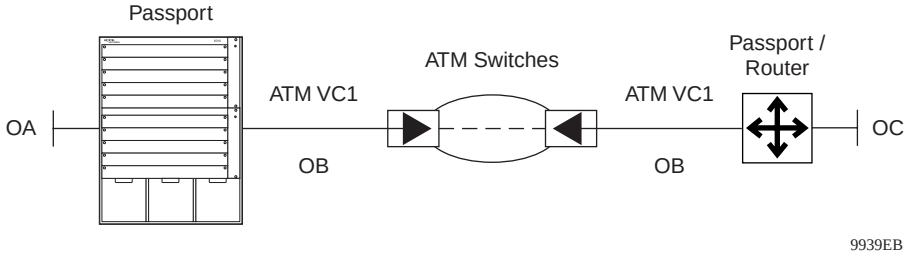
```
config atm 1/1 pvc 1483 ip create 2 0.100 <remote
side IP address>
```

The remote IP address should be in the same subnet with the ATM port IP address.

Configuring an IPX routing 1483 PVC using Device Manager

In the configuration shown in Figure 60, the Passport 8672ATME Module has an ATM 1483 PVC as the sole member of a VLAN configured for IPX routing.

Figure 60 IPX routing with ATM 1483 PVCs



Note: Each configured ATM 1483 PVC uses one VLAN. The Passport 8672ATME Module can be configured for a maximum of 256 VLANs per MDA and a maximum of 512 VLANs per card.

This configuration requires the following procedures:

- "Creating two VLANs "byPort"," next
- "Configuring IPX network numbers" on page 139
- "Enabling IPX forwarding" on page 140
- "Enabling IPX network number forwarding" on page 141
- "Configuring a null-encapsulation PVC" on page 142
- "Associating the PVC with the VLAN" on page 142

Creating two VLANs "byPort"

To create two VLANs "byPort," see "Creating a VLAN "byPort" and adding ports" on page 121. One VLAN must have only one ATM port. The second VLAN can have one or multiple Ethernet ports.

One VLAN must have only one ATM port.

The second VLAN can have one or multiple Ethernet ports.

Configuring IPX network numbers

To configure the IPX network numbers for both VLANs:

1 From the Device Manager menu bar, choose VLAN > VLANs.

The VLAN dialog box opens with the Basic tab displayed (Figure 51).

Table 42 on page 122 describes the VLAN Basic tab fields.

2 Click one of the VLANs.

3 Click IPX.

The IPX VLAN dialog box opens (Figure 61).

Figure 61 IPX VLAN dialog box

Table 49 describes the IPX VLAN dialog box fields.

Table 49 IPX VLAN dialog box fields

Field	Description
VlanId	Unique VLAN identifier.
NetAddr	IP subnet address of this VLAN.
Encap	Encapsulation format.

4 Click Insert.

The IPX VLAN, Insert dialog box opens (Figure 62).

Figure 62 IPX VLAN, Insert dialog box

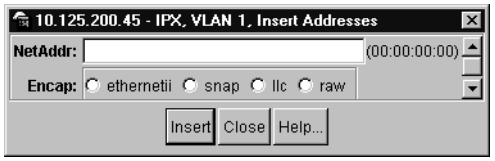


Table 50 describes the IPX VLAN, Insert dialog box fields.

Table 50 IPX VLAN, Insert dialog box fields

Field	Description
NetAddr	The IP address of this VLAN.
Encap	Encapsulation type: ethernetii, snap, llc, or raw.

5 In the NetAddr field, configure the IPX network numbers for the VLAN.

6 In the Encap field, click the encapsulation type.

7 Click Insert.

The IPX VLAN, Insert dialog box closes, and the IPX tab is redisplayed.

8 Click Close.

Enabling IPX forwarding

To enable IPX forwarding on both VLANs:

1 From the Device Manager menu bar, choose IPX Routing > IPX.

The IPX dialog box opens with the Globals tab displayed (Figure 63).

Figure 63 Globals tab

Table 51 describes the Globals tab item.

Table 51 Globals tab item

Item	Description
RoutingEnable	Enables routing.

2 Click RoutingEnable.

3 Click Apply.

4 Click Close.

Enabling IPX network number forwarding

To enable forwarding for the IPX network number:

1 From the Device Manager menu bar, choose IPX Routing > IPX.

The IPX dialog box opens with the Globals tab displayed.

2 Click the Circuits tab.

The Circuits tab opens (Figure 64).

Figure 64 Circuits tab

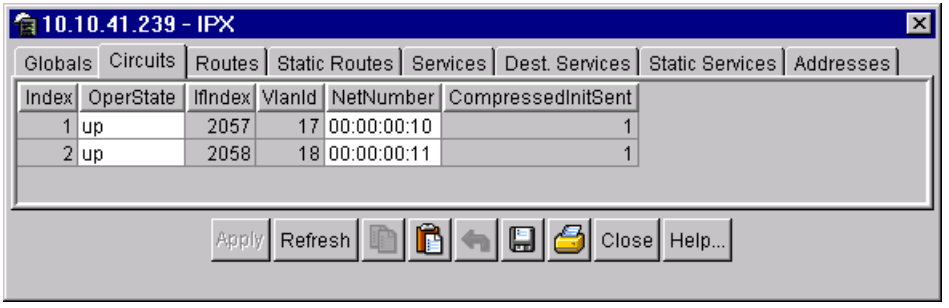


Table 52 describes the Circuits tab fields.

Table 52 Circuits tab fields

Field	Description
Index	Unique value assigned to each interface.
OperState	Current operational state of the interface.
Index	Interface Index.
VlanId	Unique VLAN identifier.
NetNumber	Network number.
CompressedInitSent	Compressed.

3 In the OperState field, enter “up” for all IPX network numbers created in this procedure.

4 Click Apply.

5 Click Close.

The Circuits tab closes, and the Globals tab is redisplayed.

6 Click Close.

Configuring a null-encapsulation PVC

See “Configuring two ATM 1483 PVCs on the same ATM port” on page 128.

Associating the PVC with the VLAN

See “Associating the PVC with the VLAN” on page 126.

Follow the instructions there except, in the ConnectType field, select Ipx instead of bridged.

Configuring an IPX routing 1483 PVC using the CLI

To configure the Passport 8672ATME Module for this setup using the CLI:

1. To create two VLANs by port, enter:

   ```
   config vlan 2 create byport 1
   config vlan 3 create byport 1
   ```

2. To add an ATM port (in this example, 1/1) and several Ethernet ports (in this example, 3/40 to 3/48) to the VLAN, enter:

   ```
   config vlan 2 port add 1/1
   config vlan 3 port add 3/40-3/48
   ```

3. To configure IPX network numbers on both VLANs (use two different subnets), enter:

   ```
   config vlan 2 ipx <ipx network number>
   config vlan 3 ipx <ipx network number>
   ```

4. To enable forwarding on IPX, enter:

   ```
   config ipx forwarding enable <ipx network number>
   ```

5. If necessary, use the following CLI commands to change RIP parameters:

   ```
   config ipx rip <sub-command>
   config ipx forwarding <sub-command>
   ```

6. To configure a 1483 PVC with LLC/SNAP-encapsulation and UBR, enter:

   ```
   config atm 1/1 pvc create 0.100 enc 1483-llc serv
   ubr
   ```

7. To associate a 1483 IPX routed PVC with a VLAN, enter:

   ```
   config atm 1/1 pvc 1483 ipx create 2 0.100 <IPX
   network number of existing vlan>
   ```

Chapter 7
Web Management

Web management allows you to monitor the Passport 8672ATME Module through a World Wide Web browser from anywhere on your network. The Web interface provides many of the same monitoring features as the Device Manager software.

Refer to *Getting Started with the Passport 8000 Series Switch Management Software* for information on:

- Accessing your switch through the Web interface
- Descriptions of the Web page layout

Use the Web interface ATM folder to monitor the Passport 8672ATME Module parameters. When you access the Web interface, the System page is displayed. The ATM folder is in the navigation pane on the left of the system page (Figure 65).

Figure 65 System page

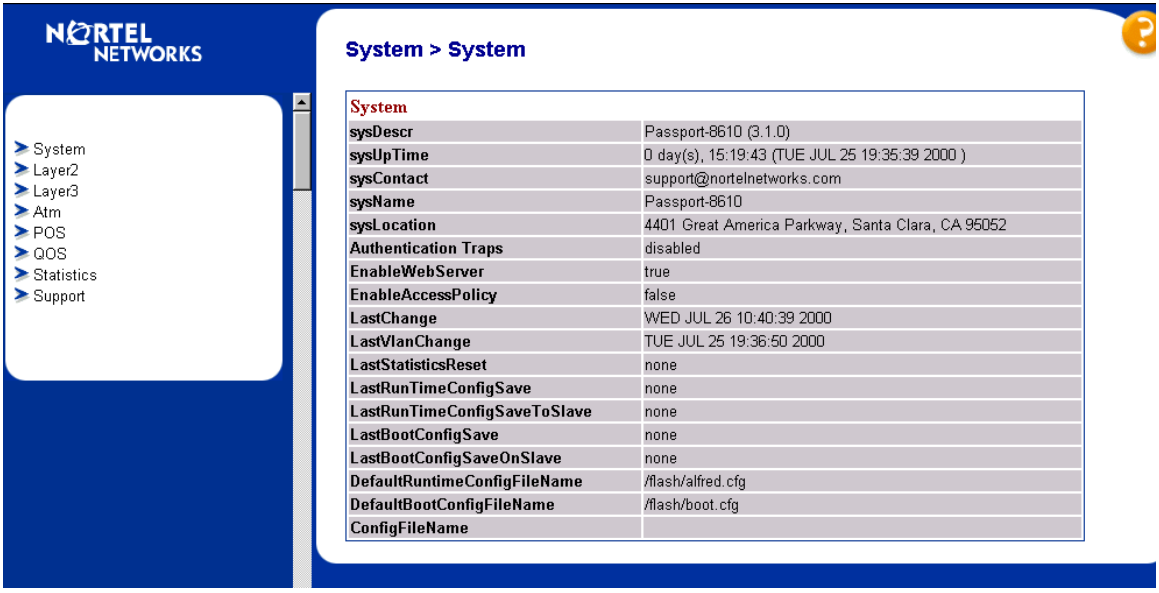


Table 53 describes the fields displayed in the System page.

Table 53 System page fields

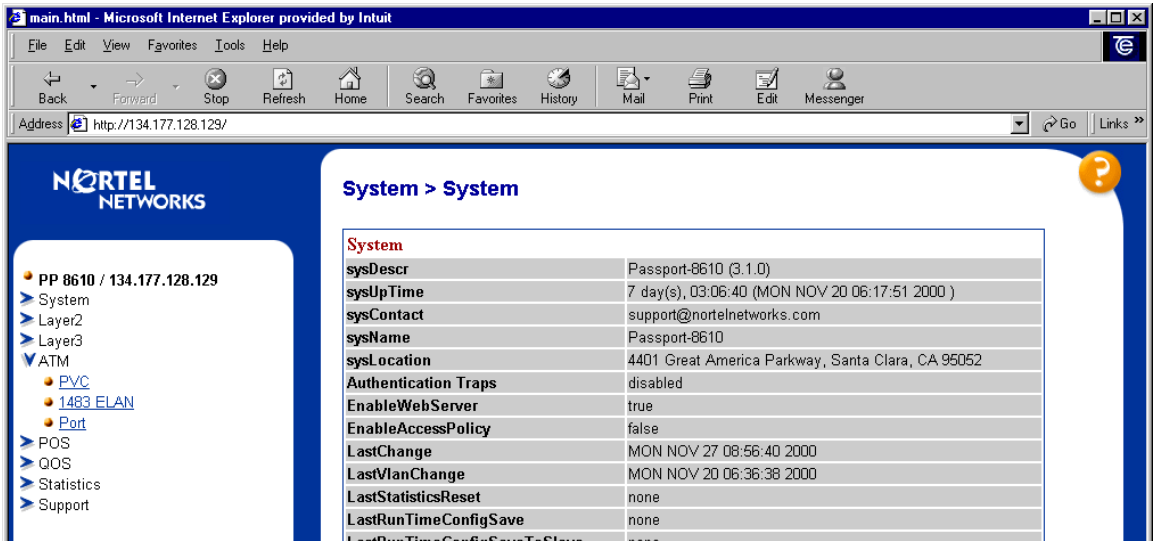
Field	Description
sysDescr	Port type of this interface. This will be OC-3 SMF/MMF or OC-12 SMF/MMF for a port on the Passport 8672ATME Module
sysUpTime	Value of system up time.
sysContact	Contact name.
sysName	Port name.
sysLocation	System location.
Authentication Traps	Enables or disables traps.
EnableWebServer	Enables the Web server.
EnableAccessPolicy	Enables access limits to be set.
LastChange	Value of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, the value is zero
LastVlanChange	Value of sysUpTime for the VLAN

Table 53 System page fields (continued)

Field	Description
LastRuntimeConfigSave	Value of sysUpTime at the time that configuration was saved.
LastRuntimeConfigSavetoSlave	Value of sysUpTime at the time that configuration was saved.
LastBootConfigSave	Value of sysUpTime at the time the last reboot occurred.
LastBootConfigSaveOnSlave	Value of sysUpTime at the time the last reboot saved configuration changes.
DefautlRuntimeConfigFileName	Default runtime configuration file name.
DefaultBootConfigFileName	Default configuration file name.
ConfigFileName	Configuration file name.

When you click ATM in the navigation pane, the headings in the ATM menu are displayed. The headings provide options for viewing ATM parameters (Figure 66).

Figure 66 ATM menu



To view the current PVC parameters, in the ATM menu, click PVC. The PVC page opens (Figure 67).

Figure 67 PVC page

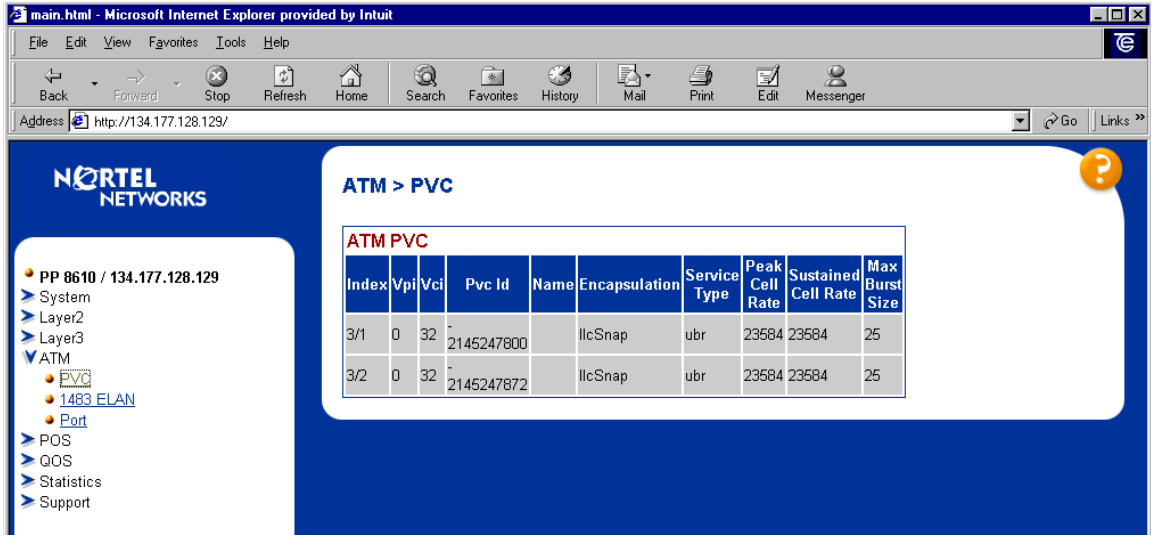


Table 54 describes the fields displayed in the PVC page.

Table 54 PVC page items

Field	Description
Index	Unique value assigned to each interface.
Vpi	VPI number.
Vci	VCI number.
Pvc Id	PVC IDs, minimum of 1 required.
Name	Emulated LAN Name.
Encapsulation	LLC/SNAP, NULL; If LLC/SNAP, then for bridge IP or IPX.
Service Type	Unspecified bit rate or variable bit rate.
Peak Cell Rate	Peak cell rate, in cells/second.
Sustained Cell Rate	Upper bound of the cell rate that is long relative to that of the PCR.
Max Burst Size	Maximum burst size determined by the signaling method. It is coded as a number of cells that can be transmitted at peak rate and still conform to the overall algorithm; only applicable if it is VBR.

To view the current 1483 ELAN parameters, in the ATM menu, click 1483 ELAN. The 1483 ELAN page opens. Figure 68 shows the left section of the page. To view the entire table, use the scroll arrow at the bottom right corner. Figure 69 shows the right section of the page.

Figure 68 1483 ELAN page, (left section)

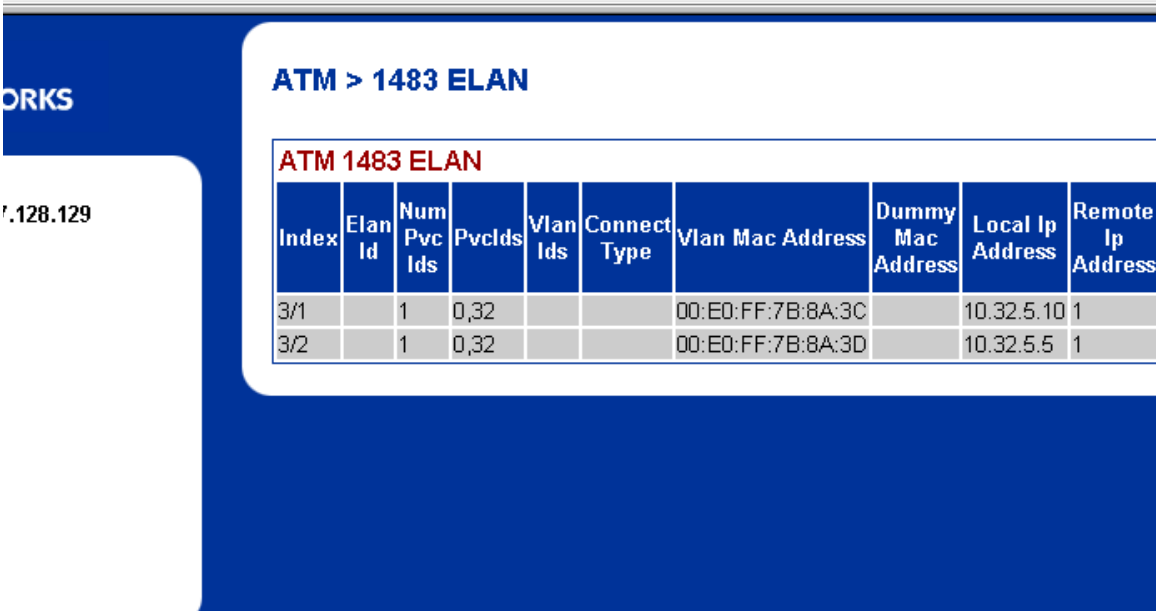


Figure 69 1483 ELAN page, (right section)

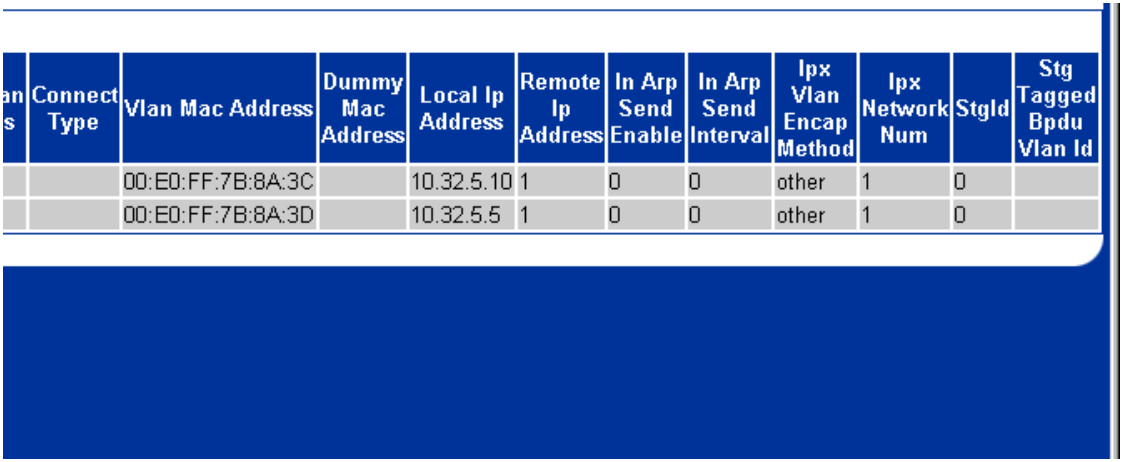


Table 55 describes the fields displayed in the 1483 ELAN page.

Table 55 1483 ELAN page items

Field	Description
Index	Unique value assigned to each interface.
Elan Id	Internal ID of the ELAN.
Num Pvc Ids	Number of PVC pairs used in the ELAN.
PvcIds	PVC IDs, minimum of 1 required.
Vlan Ids	VLAN to which the ELAN belongs.
Connect Type	Type of connection: bridged, IP, or IPX.
Vlan Mac Address	MAC address assigned to this VLAN. Used in IP and IPX routed circuits when there is no appropriate destination MAC to use.
Dummy Mac Address	Dummy MAC address assigned to this VLAN. Used in IP and IPX routed circuits when there is no appropriate source MAC to use.
Local Ip Address	Local IP address for connection type IP.
Remote Ip Address	Remote IP address for connection type IP.
In Arp Send Enable	Enables ARP sending on the ELAN for connection type IP.
In Arp Send Interval	Interval of ARP sending for connection type IP.
Ipx Vlan Encap Method	IPX VLAN encapsulation method.
Ipx Network Num	Network number; IPX only.
StgId	Spanning tree group ID. Only for bridge connection type.
Stg Tagged Bpdu Vlan Id	The VLAN ID used for tagging BPDUs.

To view the current port parameters, in the ATM menu, click Port. The Port page opens (Figure 70).

Figure 70 Port page

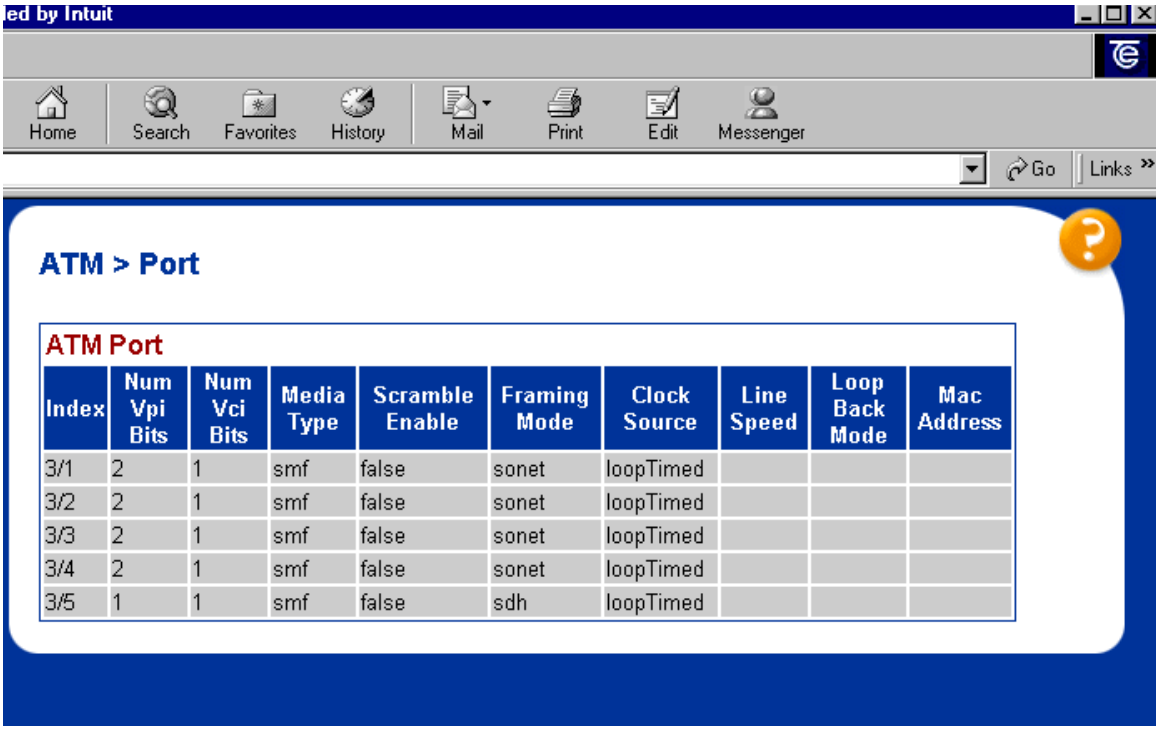


Table 56 describes the fields displayed in the Port page.

Table 56 Port page items

Field	Description
Index	Interface Index.
Num Vpi Bits	For OC-3, 11 bits split between NumVpiBits and NumVciBits. NumVciBits cannot exceed 6 bits for OC-3c. For OC-12c, 13 bits split between NumVpiBits (default is 4) and NumVciBits (default is 9). NumVpiBits cannot exceed 8 bits for OC-12c.
Num Vci Bits	This field is read only. It takes remaining bits from NumVpiBits. For example, if NumVpiBits is 3 for OC-3c, then NumVciBits is 8.
Media Type	Either SMF (single-mode fiber) or MMF (multi-mode fiber).
Scramble Enable	Enables or disables scrambling.

Table 56 Port page items (continued)

Field	Description
Framing Mode	Sets the framing for the port to: • sonet (Synchronous Optical Network), the standard format used in North America. • sdh (Synchronous Digital Hierarchy), the standard format used worldwide except in North America.
Clock Source	Sets the framing clock source for the port to: • loopTimed means clocking is derived from SONET line**.** • freeRunning means clocking is derived from on-board clock. Note that if you have two connected Passport 8672ATME Modules, you must set both to freeRunning or one to freeRunning and one to loopTimed; do not set both to loopTimed.
Line Speed	155 MBS or 622 MBS
Loop Back Mode	Sets the loopback mode to: • off • internal • external
Mac Address	The MAC address assigned to this VLAN (used in IP and IPX routed circuits when there is no appropriate destination MAC to use).

Appendix A
Technical Specifications

This appendix lists the technical specifications for the Passport 8672ATME Module.

Environmental specifications	
Operating temperature:	5° to 40° C (41° to 104° F)
Storage temperature:	-25° to 70° C (-13° to 158° F)
Operating humidity:	85% maximum relative humidity, noncondensing
Storage humidity:	95% maximum relative humidity, noncondensing
Operating altitude	3,000 m (10,000 feet) maximum
Storage altitude	Up to 9,000 m (30,000 feet) above sea level
Free fall/drop:	ISO 4180-s, NSTA 1A
Vibration:	IEC 68-2-6/34
Shock/bump:	IEC 68-2-27/29
Physical specifications	
Height:	1.050 inches
Width:	12.968 inches
Depth:	10.950 inches
Weight (single module):	3.12 lbs.
Performance specifications (64-byte packets)	
Mean time between failure (MTBF)	85,000 hours
Frame length:	64 to 1750 octets

Safety agency approvals	UL Listed (UL 1950)
	CUL CSA 22.2 No. 950
	IEC 950/EN 60950
	CE mark
	CB Scheme Test Report and Certification
	NOM (NOM-019-SCFI-1994)
Electromagnetic emissions	
Meets requirements of:	US: FCC, CFR 47, Part 15, Subpart B, Class A
	Canada: ICES-003, Issue-2, Class A
	Australia/New Zealand: AS/NZS 3548:1995, Class A
	Japan: VCCI V-3/97.04, Class A
	Taiwan: CNS 13438,Class A
	EN 55 022:1998/CISPR 22:1997), Class A
	CE Mark
	Electromagnetic Immunity: EN55024:1998/ CISPR24:1997

Appendix B
Factory defaults

Table 57 shows the default settings on the Passport 8672ATME Module as it comes from the factory, as well as the management tool to change parameters.

Table 57 Factory default settings for the Passport 8672ATME Module

Parameter	Default	Management tool
VPI bits OC-3	4	Device Manager
VPI bits OC-12	4	Device Manager
VCI bits OC-3	7	Device Manager
VCI bits OC-12	9	Device Manager
Scrambling	Enabled	Device Manager
Framing	SONET	Device Manager
Clock source	Free-running	Device Manager
Loopback mode	Internal	Device Manager
Encapsulation	LLC-SNAP	Device Manager
Bit rate	UBR	Device Manager
Traffic shaping	Disabled	Device Manager
F5 OAM requests	Disabled	Device Manager
F5 OAM responses	Enabled	Device Manager

For more information on factory defaults, refer to:

- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using the Command Line Interface Release 3.2*
- *Configuring Switching and Routing Operations for the Passport 8000 Series Switch Using Device Manager Release 5.x.x*

Index

A

access, passwords 49
action command 80
Action field, port 54
add command 82
AdminStatus field, port 53
ATM
  configuring 51
  managing 51
ATM (asynchronous transfer mode)
  about 33
ATM 1483 command 93, 94
ATM 1483 ELAN
  configuring parameters 64
  deleting 69
  Web interface 149
ATM 1483 ELAN tab 126
  accessing 64
  fields 65, 66
ATM ELANs 27
ATM F5-OAM loopback
  configuring, with DM 70
  configuring, with the CLI 111
ATM port parameters
  Web interface 147
ATM port parameters, editing 58
ATM PVC
  associating with VLAN 127, 136, 137, 142, 143
  configuring 127, 136
  null encapsulation 137, 142, 143
ATM PVC tab
  accessing 60
  fields 61
ATM PVCs, deleting 63
ATM QoS 26
ATM tab, accessing 58
ATM terms 33
Authentication Traps 146

C

Card tab
  accessing 54
  fields 55
card-reset command 77
cell switching 34
circuit parameters, editing 60
Circuits tab 141
clear atm f5-oam command 115
CLI
  configuration commands 76
  module commands 76
  overview 75
  port commands 79
  show commands 85
clock setting, changing 118, 119
clock source 152
clocking 60, 80
clock-source command 80
ClockSource field 60
command line interface (CLI) 75
config atm info command 84

config atm pvc 1483 bridged command 82
config atm pvc 1483 command 82
config atm pvc 1483 ip command 82
config atm pvc 1483 ipx command 82
config atm pvc command 81
config atm pvc f5-oam command 112
configuration 44
  basic procedures 120
  initial tasks 29
Connect Type field 150
connectivity 25
ConnectType field 65, 66
conventions, text 20
CPU 117
create command 81, 82, 83, 84
customer support 24

D

data transmission 34
debug mode 77
default settings 155
delete command 82, 83, 84
Descr field 53
Description field, MDA 57
Device Manager
  common screen buttons 51
  configuration 48
  edit card 54
  installing 49
  module 54
  passwords 49
Diag port 32
diagnostics 80
DiffServ 26
distance, maximum 36
downloading image 44
DummyMacAddress field 65, 150

E

Elan Id field 150
ElanId field 65
ELANs 34, 81
EnableAccessPolicy field 146
EnableWebServer field 146
encapsulation 61, 62, 81, 148
environmental precautions 37
environmental specifications 153
ethernet VLANs 27

F

F5 Loopback statistics 72
F5-OAM loopback
  configuring, with DM 70
  configuring, with the CLI 111
factory defaults 155
failover 117
far end line interval statistics 98
far end line statistics 96
far end path interval statistics 100
far end path statistics 99
fiber optic equipment 38
flush tables 80
framing mode 58, 152
framing mode command 80
FramingMode field 60

G

Globals tab 140

H

hot-swapping
  I/O module 45
  media dependent adapters (MDAs) 45
  module 45

I

I/O module
hot-swapping 45
ifIndex field 59
image filename 77
InArpSendEnable field 65, 66, 150
InArpSendInterval field 65, 66, 150
index field 53, 148, 150, 151
info command 77, 81, 82, 83, 84
Insert ATM PVC dialog box 62
accessing 60
fields 62
Interface tab 53
fields 53
Interface window 51
IP Address tab 131, 132, 134
IP address, assigning 130, 137
IP routing
configuring 136
enabling 137
IPX forwarding
enabling the IPX network number 141
enabling with Device Manager 140
enabling with the CLI 143
IPX network number
configuring 139, 141, 143
IPX routing, configuring 143
IPX routing, relevant fields 68
IPX VLAN dialog box 139
Ipx Vlan Encap Method field 150
IpxNetworkNum field 66, 150
IpxNetworkNumber field 65
IpxVlanEncapMethod field 65, 66

L

LastChange field 53, 146
LastVlanChange field 146
LbDownCount field 72
LbMgmtEnable field 71
LbReplyReceive field 73
LbReplySent field 73
LbRequestSent field 73
LbRetryFrequency field 71
LbSendFrequency field 71
LbUpCount field 72
LEDs
online 30
line interval statistics 103
line speed 152
line statistics 102
LineSpeed field 59
LLC/SNAP encapsulation 26
Local Ip Address field 150
LocalIpAddress field 65, 66
Loop Back Mode 152
loop-back-mode command 80
LoopBackMode field 60

M

Mac address 152
MAN/WAN/campus connectivity 25
management 48, 120
MaxBurstSize field 61, 62, 148
maximum burst size (MBS) 81
MBS (maximum burst size) 34
media dependent adapters (MDAs)
description 29
dialog box 57
inserting 44
overview 25
port number 48
slot number 48
viewing information 56
Media Type field 151

MediaType field 59
MMF (multimode fiber) 25
module
  resetting 54
module configuration 51
module configuration commands 76
module initialization 41
module replacement 45
multimode fiber (MMF) 25

N

name field 53, 61, 62, 148
null encapsulation
  configuring 136
Num Pvc Ids field 150
Num Vci Bits field 151
Num Vpi Bits field 151
number-vpi-bits command 80
NumPvcIds field 65
NumVciBits field 59
NumVpiBits field 59

O

Online LED 30
OperSpeed field 53
OperStatus field, port 53
OSPF routing, enabling 134
OSPF tab 134

P

packet loss counters 116
Passport 8000 series chassis 50
Passport 8600 Routing Switch 25
Passport 8672ATM Module
  configuration 48
  hot-swapping 45
  initialization 41
  installing 39
Passport 8690SF Module 32, 42, 117
Passport 8691SF Module 32, 42, 117
passwords 49
path interval statistics 106
path statistics 104
PCR (peak cell rate) 34, 81
PeakCellRate field 61, 62, 148
performance specifications 153
PhysAddress field 53
physical specifications 153
point-to-point traffic 120, 127
port
  color codes 50
  configuration commands 79
  information 85
  naming 53
  numbering 47
  setting 81
port parameters
  ATM 1483 ELAN 64, 69
  ATM PVC 60
  enabling 58
precautions 37
product support 24
publications
  hard copy 24
  related 21
PVC (permanent virtual circuit) 33
Pvc Id field 148
PVC parameters, Web interface 147
PvcId field 61
PvcIds field 65, 66, 150

PVCs
creating 81
displaying information 91
PVCs, configuring 60

R

rcStgTaggedBpduVlanId field 65
reboot 77
Remote Ip Address field 150
RemoteIpAddress field 65, 66
remove command 83
reset module 54, 77
Result field, port 54
RFC 1483
bridging 26
PVCs 26
routed IP 28
routed IPX 28
support 28

S

safety agency approvals 154
safety precautions 37, 39
SCR (sustainable cell rate) 34, 81
Scramble Enable field 151
ScrambleEnable field 59
scrambling command 80
screen buttons 51
section interval statistics 108
section statistics 107
security 59
ServiceType field 61, 62, 148
sh ports stats interface main command 116
Show commands 85
show ports info atm 1483 command 93, 94
show ports info atm all command 85
show ports info atm f5-oam command 114
show ports info atm fdb command 88
show ports info atm pvc command 89, 91, 113
show ports stats atm felinecurrent command 96
show ports stats atm felineinterval command 98
show ports stats atm fepathcurrent command 99
show ports stats atm fepathinterval command 100
show ports stats atm linecurrent command 102
show ports stats atm lineinterval command 103
show ports stats atm pathcurrent command 104
show ports stats atm pathinterval command 106
show ports stats atm sectioncurrent command 107
show ports stats atm sectioninterval command 108
show ports stats atm sonetmediumtbl command 109, 110
single-mode fiber (SMF) 25
slot number 48
SMF (single-mode fiber) 25
SONET 59, 60, 80
SONET medium statistics 110
SONET multiplex network 25
SONET terms 35
state command 81
statistics 73
Stg Tagged Bpdu Vlan Id field 150
StgId field 65, 150
support, Nortel Networks 24
Sustained Cell Rate field 148
SustainedCellRate field 61, 62
SVC (switched virtual circuit) 34
Synchronous Digital Hierarchy (SDH) 35, 60, 80
sysContact field 146
sysDescr field 146
sysLocation field 146
sysName field 146
System page 146

sysUpTime field 146

T

technical publications 24
technical specifications 153
technical support 24
technology overview 33
testing 73, 80
text conventions 20
timing 60, 80
traffic shaping 27
transmission distance 36
transmission rates 36
TrapEnable field 72
troubleshooting
  displaying the image filename 77
  downloading the image file 44
  loop-back-mode 80
  maximum cabling distances 36
  PVCs 82
  saving changes 51
  saving your configuration 44
Type field, MDA 57
Type field, port 53

U

UBR (unspecified bit rate) 34, 81

V

VBR (variable bit rate) 34, 81
VC (virtual circuit) 34
VCI (virtual circuit identifier) 34, 80, 81, 82
Vci field 61, 62, 148
VcStatus field 73
VendorDescr field, port 53
VLAN
  creating 127, 130, 136, 138, 143
  creating "byPort" 138
VLAN Basic tab 130, 132, 134, 139
Vlan Ids field 150
Vlan Mac Address field 150
VlanId field 65, 66
VlanMacAddress field 65
VLANs 81
VNR (virtual network router) 27
VP (virtual path) 34
VPI (virtual path identifier) 34, 80, 81, 82
Vpi field 61, 62, 148
VRRP 26

W

Web management 145